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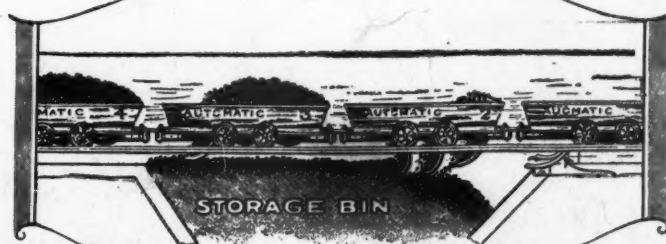
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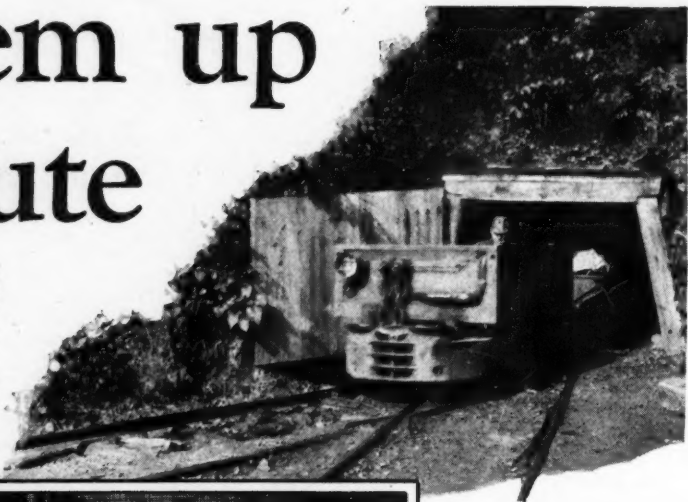
"S-D" GRIFFITH AUTOMATICS



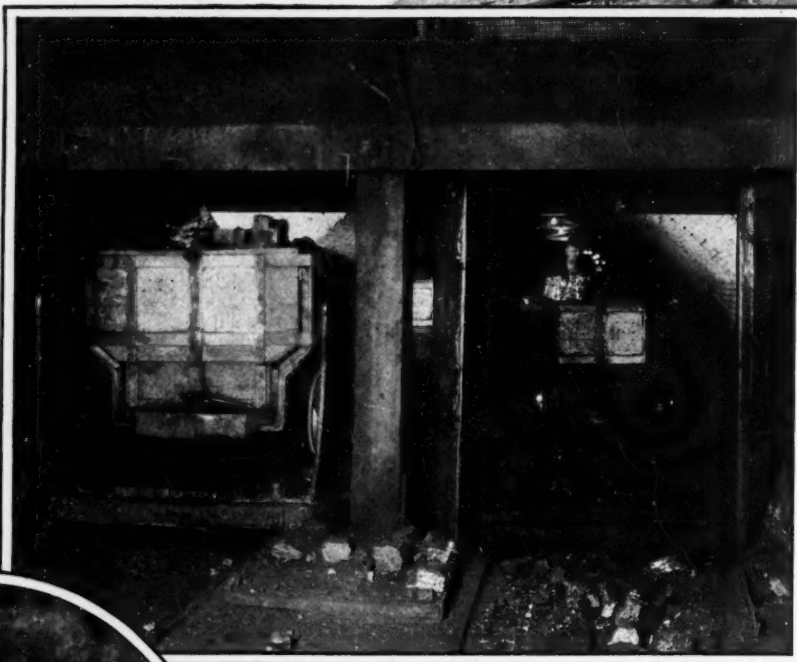
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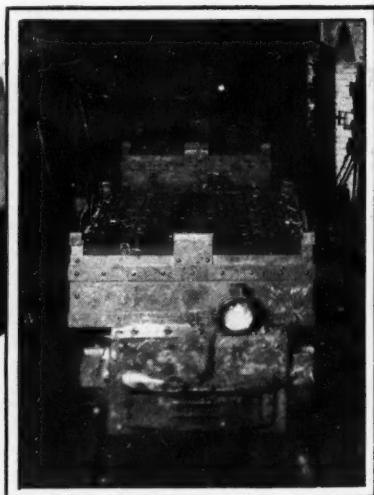
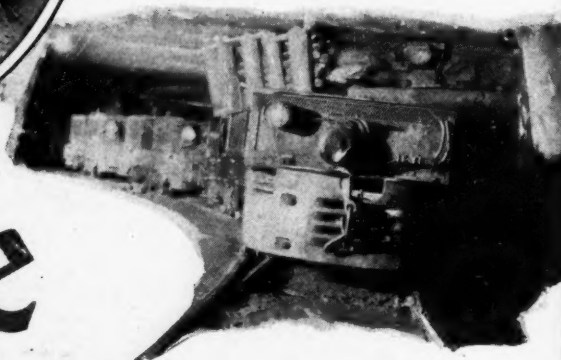


Here comes the last trip of the day; yet it steps right along because in the battery box of the motor is an Exide-Ironclad. The speed and pep of this battery hold up to the end of discharge period.



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With which is consolidated "The Colliery Engineer" and "Mines and Minerals"
R. DAWSON HALL, Engineering Editor

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McGraw-Hill Publishing Company, Inc.

Tenth Avenue at 36th Street, NEW YORK, N. Y.

WASHINGTON, Colorado Building
CHICAGO, 7 South Dearborn Street
PHILADELPHIA, 16th and Parkway
CLEVELAND, Guardian Building
ST. LOUIS, Star Building
SAN FRANCISCO, 883 Mission Street
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Cable Address: "Machinist, N. Y."

The annual subscription rate is \$3 in the United States, Canada, Mexico, Alaska, Hawaii, the Philippines, Porto Rico, Canal Zone, Cuba, Honduras, Nicaragua, Dominican Republic, Salvador, Peru, Colombia, Bolivia, Ecuador, Argentina, Chile, Spain, Panama, Brazil, Uruguay, Costa Rica, Guatemala, Haiti and Paraguay. Extra foreign postage \$3 (total \$6 or 25 shillings). Single copies, 20 cents. Change of Address—When change of address is ordered the new and the old address must be given. Notice must be received at least ten days before the change takes place.

Copyright, 1926
By McGraw-Hill Publishing Company, Inc.

Published weekly
Entered as second-class matter
Oct. 14, 1911, at the Post
Office at New York, N. Y.,
under the Act of March 3,
1879.

Printed in U. S. A.
Member Audit Bureau of
Circulations
Member Associated Business
Papers, Inc.

Number of copies printed
this issue, 10,230

The Whys of Achievement

Next week *Coal Age* will discuss and describe the New Orient Mine. The authors of the various articles wanted to know not only what was at that phenomenal plant but also *why* it was there and *how* it fitted into the scheme of things that made New Orient so successful. After all what we want to know about other plants is not solely what they are but why this or that plan was adopted and how it serves its purpose. Mere description fails to satisfy.

A Comprehensive Survey

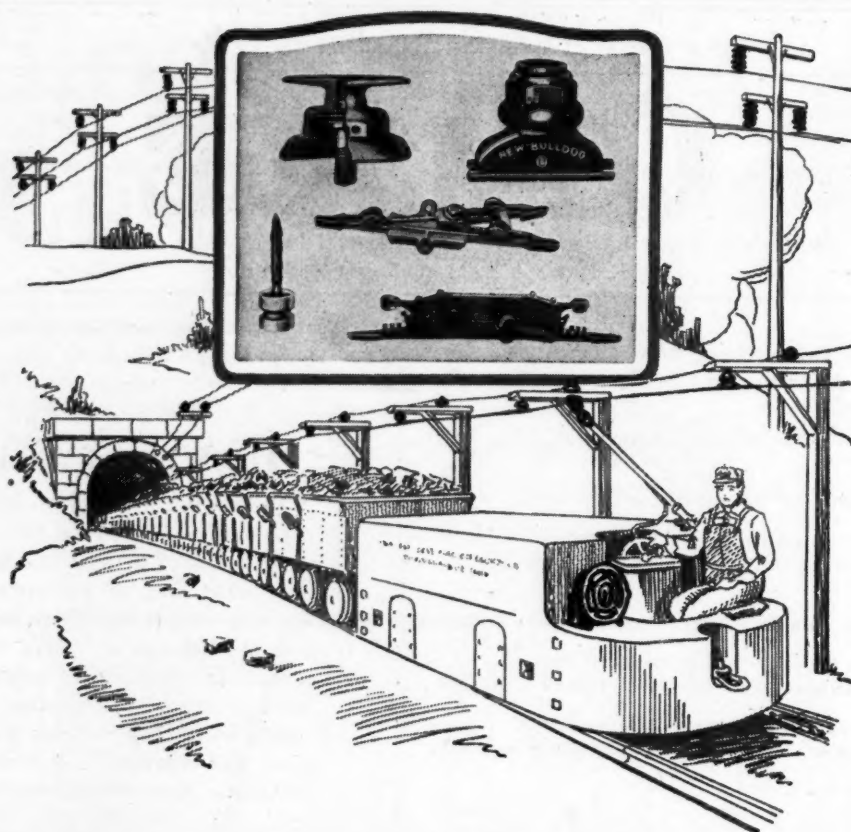
The authors of these articles have essayed, we believe successfully, to ascertain the part which each item plays in the whole scheme of things, and as it was not any one single development that achieved the success, so *Coal Age* covers all phases—mining, transportation, preparation, ventilation, electrification and sales plans.

A. F. Brosky covers the general mining phases backed by his extensive observation of mine conditions in many fields. J. H. Edwards covers the electrical equipment. Sydney A. Hale throws light on the marketing problems. When you have read these articles you will have a complete picture of New Orient, from the coal face to the consumer's bin.

Reading That Helps

Big as New Orient is it has its lessons for every operator and engineer. Mines may be small or large, but, whatever they are, they must be planned as diligently as New Orient, if they are to produce cheap coal. Thus this Model Mine Number of 1926 has suggestions for everyone.

To read one's technical journal advantageously one must study it, not alone as a record of others' mines, even of others' achievements, but as a guide and an incentive toward similar efforts.



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Devoted to the Operating, Technical and Business
Problems of the Coal-Mining Industry

R. Dawson Hall
Engineering Editor

Volume 30

NEW YORK, SEPTEMBER 2, 1926

Number 10

Smaller and Better Mines

HOW MANY ENTERPRISES have been wrecked by men of fickle mind who started too many lines of effort, spent money on them all, lavished enthusiasm on them and left them uncompleted! Some men are good beginners. The mines are full of such men who are infatuated with starting something new, who no sooner have a mine started than they would like to leave it for another that they imagine will be better and more favorable to operation.

They lose interest as soon as things get going nicely. Many even can hardly see a heading completed and the rooms driven up than drawn away by some thicker streak of coal they begin transferring their effort to some other section. Some do not even have to find any such inducement; they forget that the expenditures that have been made, justify them in "staying put" till the last ton of coal is recovered and the last cent of expenditure on the original project has earned its entire reward. They forget that relaid rails and switches and restrung wire are not as good as the same material in place and that relaying and restringing are expensive operations.

True, other reasons than the mere idiosyncrasy of the individual may cause him to withdraw from a section of the mine without complete extraction of the coal. Water becomes troublesome, good pillarmen are lacking, some repairs become inevitable, pillar drawing injures the surface and improperly executed may cause a squeeze. So pillars are left. But such standing places harbor coal dust and gas, and the mine becomes less safe. Timber rots and vitiates the atmosphere and fills it with spores that rot posts and cross bars. A better way, by far, is to clean up as one goes along.

Roads and pillars left soon become unrecoverable; long haulage roads have to be tracked, wired, posted and maintained and haulage is excessively expensive. The coal beyond is operated under unfavorable circumstances, and if the old headings are to be reopened the cost of the work is appalling. Track must be relaid, wire must be restrung, switches must be replaced, rock must be loaded up and hauled out, pillars must be skipped, timber must be replaced and set more closely than before. Pillaring instead of being the most profitable part of the whole operation becomes the most expensive in cost of material, labor and human life. A mine kept small by complete extraction is far better than a large mine with only a part of the coal removed. It is safer and more economical to operate. It does not vitiate the air or supply places for the accumulation of gas. The main headings are all that are left of old workings. Pressure ceases for the overburden eventually supports itself on the bottom. The dangers are reduced. If coal is left it should be left as wing pillars to support the main roadways not to keep up workings that no longer have any value.

Mines should be kept small by completeness of extraction and by the closing in of mined areas. Thus "Smaller and better" as well as "Bigger and better" mines are good slogans. A mine should be small in the sense that it is unencumbered by acres of half-mined areas and big in the sense that it is able to produce a large tonnage with all the advantages of big production. What Castle Gate is doing and Colonel O'Toole is advocating and practising is merely that which is the general trend of modern mining. Those who leave coal in the ground should have the weightiest of reasons for so doing—and there are some—or they should clean up as they go.

Wood Preservation

BECAUSE THE COAL industry is too often in difficulties only to become a few months later the spoiled child of fortune, because it is rendered financially helpless by bad markets and indifferent to economy by the kiting prices that follow shortly thereafter, it has never given due consideration to the great benefits of wood preservation.

A more stable industry, fortunate enough to have money available even for expenditures not immediately remunerative and never so happily circumstanced as to be indifferent to future profits, would certainly have either seized on so productive an investment as the treatment of timber or would have refused to purchase any other than timber that had been treated.

The railroad industry, despite all its misfortunes, has not been slow to see how much is to be gained by using tie and post timbers that will not have to be replaced every few years with the attendant expense of installing the new material in the track or in the fence line. The profits are slow in coming, but they are certain and considerable. The railroads are to be congratulated on their recognition of the importance of this source of income. Figures show that untreated timber must be replaced twelve times in thirty-six years, zinc-treated timber four times and creosoted timber three times in the same period. In the long run untreated timber is 53 per cent more expensive than zinc-treated timber and 60 per cent more than creosoted timber.

Because much of the timber in mines cannot be treated with advantage is no reason why ties and cross bars should not receive treatment, making the cost of replacements less and keeping the track in better condition. About 35 per cent of the railroads' revenue traffic is derived from coal and all of it has to be hauled over those miniature railroads called mine tracks under conditions none too favorable for efficient transportation. Why not in this as in other ways take a leaf from the example of the railroads? They have found it profitable to use treated timber. Why not the coal companies?

Nothing, it may be added, is more incomprehensible than the indifference to the life of the wood used in mine cars which becoming wetted as a rule with every loading are dried again as they stand in the broiling sun at the surface. Wetted and dried the wood swells and contracts, loosens at the bolt holes, checks and splits. Properly creosoted it should be less subject to such deleterious action.

Mr. Bradley's Interview

TO THOSE WHO scorn press interviews and believe they result only in misconceptions and misrepresentations, J. G. Bradley's experience on his return from Great Britain must come as a pleasant surprise. If it had no other effect, it created a favorable meeting ground for the operators with the press and laid the way for kindlier comment than has hitherto been customary. Certainly the best interests of the industry are advanced by such contacts. The papers carried accurate, friendly and copious reports of the interview.

When mine workers' officials, the Administration, politicians and sociologists—or should it be socialists?—welcome such opportunities, should business alone be silent? Should the man whose income is affected by unfavorable comment and the legislation that follows it be alone unheard? Too often the business man has tried secretly to plan for his own advantage. He may be honest and upright in his aims and may endeavor to advance them in honorable ways but suspicion will always result. Where there is silence not a few will think that evil spots are being glossed over.

Some may question a few of Mr. Bradley's dicta. They may be disposed to believe that the more inefficient mines of Great Britain might well be closed with advantage and that the new mines in Yorkshire and those in Kent would be able and should be allowed to furnish cheaply the coal that the inefficient mines are now supplying at great expenditure of labor.

The old mines abandoned would fill with water, and experience shows that submerged timber rots but little and does not let the roof fall to such an extent as to preclude reopening. The real danger lies in the fact that when a mine is reopened in an area occupied by abandoned mines which have been drowned, there is serious danger of incursions of water that may make operation hazardous.

Many old mines have been reopened in America and if that has been found an expensive proposition it was largely because they were not properly laid out in the first instance and had roadways too low and too narrow for profitable operation. But such obsolescence would have plagued them had they remained in operation. The public of Great Britain would not respond perhaps to Mr. Bradley's suggestion that the new and extremely valuable territory should be kept in reserve so as to keep busy the inefficient mines and their employees.

East Yorkshire and Kent, with new villages and unspoiled surroundings, make ideal places for human habitation and it would seem better not to keep them undeveloped but rather to arrange for the transference of population from the villages of the Forest of Dean with their thinner seams and older houses. The operators and even the mine workers of those mines might object, but the miners themselves and Great Britain as a whole would be benefited. Unfortunately the British are always unwilling to junk old mines and

old equipment or to part with old home ties. The fortitude to write off improvements and machinery when obsolescent is not a British characteristic.

But the value of the interview lies not in its message, however sound were most of its conclusions, but in the fact that it makes closer the tie between the coal industry, the press and the public. Sound, indeed, however, is the conclusion of Mr. Bradley that the entry of industry into politics is harmful in the extreme. The anxiety to find issues, to create inharmonious relations, to put a wedge between capital and labor, to separate industrial forces whose interests are quite largely common, all these psychological conditions that strife has engendered in Great Britain can only result in injury to the body politic.

True also is it, as Mr. Bradley said, that the public today has to pay not only the workman but his walking delegate also, and, furthermore, is made to pay for the time which managers and employees expend in labor negotiations rather than in seeking industrial efficiency. Discussion rather than action, dissension rather than production constitute too often the main employments of managements and men.

When so much time is wasted in fostering and allaying discontent, disagreement, delay and confusion, no time is left for improving industrial processes. The machinery of offense and conciliation deprives all other machinery of power, so that no opportunity is left for industrial progress, yet it is from greater productivity alone that increased wages can come.

Coal as Fertilizer

EXPERIMENTS MAY HAVE been made by soil experts under proper conditions to ascertain whether coal alone or coal mixed with lime would improve ground for agricultural purposes. If they have not, they surely should be, because many are trying that method of fertilization and some who have tried it are enthusiastic.

Not a few of these, doubtless, argue that coal is largely carbon, and so is vegetation, so why should not the agriculturist avail himself of that fact? On the other hand, plant experts declare that plants derive their carbon from the air, not from the soil, that the leaves absorb it and not the roots. But, is all of coal carbon and may not the non-carbon material be in highly assimilable form?

Argument without experiment is largely vain. Because it has been expected by some that vegetation will glut itself with avidity on the carbon of coal is no reason why those who know better should not venture to ask whether coal, nevertheless, may not contain something that the plant needs, may not be able to impart to the soil a physical condition favorable to growth and drainage and may not in some cases be almost the only available source of acid to neutralize excessive alkali.

Just as present what is wanted is not "What do you think?" but "What do you know?" The experiments referred to on p. 288 of last week's issue were not made with controls. The ground tested was differently watered and manured apparently than that around it. This throws a little doubt over the conclusions reached. However it may be recalled that a writer in a scientific publication of Germany recently advocated the use of coal and lime in preparing the ground for cultivation, and surely it is time that some inquiry was set on foot, if none has been made hitherto.

Castle Gate No. 2 Mine Takes Strong Steps To Eliminate Explosion Hazard

Closes Off Idle Rooms with Heavy Brattices—Sprinkles Intensively All Working Faces and Entries to Minimize Coal Dust—Introduces Rock Dust and Improves Blasting Practice—Modifies Electrical Installation

By George J. Young

*Associate Editor, Coal Age,
San Francisco, Cal.*

CASTLE GATE No. 3 mine of the Utah Fuel Co., at Castlegate, Utah, affords an interesting study of methods taken to restore satisfactory conditions in a mine after a violent explosion in which many men were killed. The explosion occurred on March 8, 1924. Since that time the mine has been rehabilitated, important changes have been made in operating methods, and coal is again being produced. The mine is on Willow Creek, a short distance from Castlegate. Its product is delivered to a tippie in that town, which also serves No. 1 mine which lies immediately to the southwest.

Though No. 2 mine reaches the surface by a drift, the latter leads shortly to a long slope that does not come to daylight. All the coal is brought to the parting at the head of this slope, from which it is hauled to the surface and thence to the tippie. The slope has only a single track which is of 40-in. gage, and it serves the entries above and below the haulage adit. At first the chain pillars on the slope were made 50 ft. wide but they were increased to 100 ft. when the cover became heavy. Barrier pillars on the slope have been increased from a thickness of 150 to 225 ft. as the cover has increased.

The mine is laid out on the double-entry system with panels separated by 75-ft. barrier pillars. The panels give the rooms an effective mining length of 350 ft. or more. The maximum distance between cross entries is 500 ft. On the side entries, the chain pillars are 50 ft. thick, and as the cover increases on their dip they are widened to 70 ft. The rooms are driven at an angle of 45 deg. to the haulage entries as the inclination of the seam is about 10 per cent. They are 20 ft. wide, 7 ft. high, and the pillars vary from 50 to 70 ft. depending on

the thickness of the cover. The room necks are 12 ft. wide at the entry but are widened to 20 ft. in a distance of 25 ft. The crosscuts are staggered and driven from 50 to 100 ft. apart.

On the main haulage and on the slope the stoppings are of concrete, one foot thick, and on the side entries they are of the same material, but the thickness is reduced to 8 in. Overcasts and undercasts are of reinforced concrete.

The coal seam is 23 ft. thick with sandstone roof and floor. A composite of several samples taken in various parts of the *D* seam in No. 2 mine as analyzed by the U. S. Bureau of Mines shows 43.3 per cent volatile matter, 48.2 fixed carbon, 5.6 ash and 0.4 per cent sulphur. The superimposed strata vary in thickness but reach 1,000 ft. and even more in places. Deep canyons connecting with the main drainage system, which is Willow Creek, characterize the topography. The mine entrances are at the level of Willow Creek Valley, the coal being hauled by electric locomotives to the tippie at Castlegate.

Prior to the explosion, pillars were not drawn and the coal was worked to an irregular height. The original plan was to work the rooms to a height of 14 ft. on the advance. As there were no definite partings at which the coal would break and come down, the height of the mining was naturally more or less irregular. It is obvious that, as the mine increased in area, these conditions introduced difficulty in maintaining proper ventilation and in affording safety in operation.

When the mine was reopened the practice was changed. This change included the sealing of large areas of open work and the introduction of pillar mining. Further changes were an improvement in the un-



Fig. 1—Looking Across Valley

It will be noted how high are the elevations of the hills. Dry most of the year, once in a while will come a tremendous cloudburst, the water of which not being retained by vegetation or absorbed in any degree by the ground turns the valleys into raging torrents.

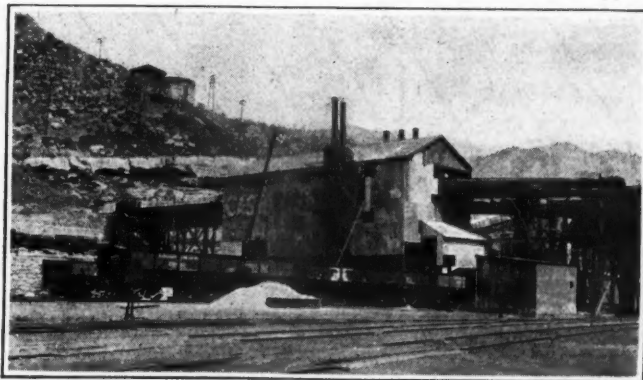


Fig. 2—Castle Gate Tippie, Castlegate, Utah

This tippie serves both mines, Nos. 1 and 2, the coal being brought some distance by electric locomotives. The mine is dry normally, but the dust is kept well damped down at the working faces and in the cars, a 4-ton of water being lavished on every ton of coal.

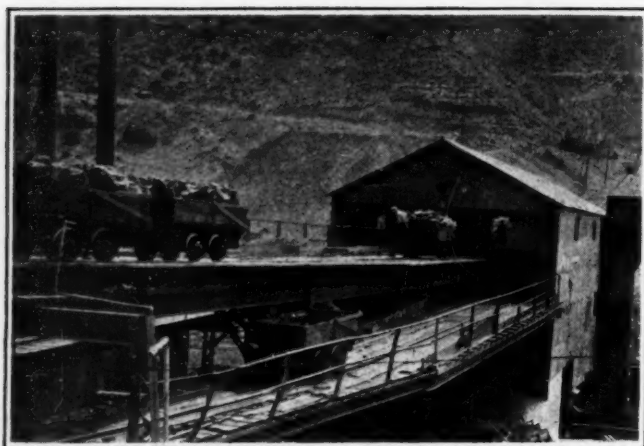


Fig. 3—Close-Up of Castle Gate Tipple

With high coal the West has largely the high and narrow type of car which has had to be replaced with cars of low build and greater width in many parts of the East where seams are thinner. Note the sprinkling equipment in the left foreground.

derground electrical installation, the isolation of the various panels by rock-dust barriers and the general use of rock dusting in entries and haulageways. An important feature was the greater use of water sprays. A more thorough operating organization has been worked out, and more attention is being given to mine inspection.

Yet Castle Gate No. 2 was always regarded as a carefully operated mine, all the customary precautions being taken to prevent explosions. The disaster of 1924 called attention to the need for more than ordinary precautions which before that time had been regarded as sufficient. It also called attention to the danger of having too large an area open in the mine, for when this is the case the

difficulties of inspection are increased and the task of keeping the whole mine area in a safe condition by wetting down and controlling ventilation becomes much more onerous.

SHRINKING CASTLE GATE MINE

Substantial seals are being erected in various parts of the mine, so as to reduce the aggregate open area to a minimum, that minimum being the active producing area of the mine. The seals being erected are 6 ft. thick and constructed of 6-ft. lengths of timber laid horizontally with interposed layers of earth and fine rock. An outer facing of concrete is placed against the ends of the timber, and a short length of pipe, communicating with the inner sealed space and fitted with a valve, is placed close to the top of the seal. This facilitates testing for gas in sealed areas.

Adobe dust is stacked at the sides and at the mouths of entries and haulageways. It is renewed when sampling indicates too large a proportion of coal dust. Main haulage, slope and side entries are systematically covered by machine with limestone or gypsum dust at regular intervals. V-troughs and flat shelves, two or three tiers high, are loaded with rock dust and placed so as to isolate all open panels. In addition shelf barriers will be erected at all room necks where the room is in active operation. These will consist of three 1x12-in. boards supported on two or three props and loaded with adobe dust. Limestone dust complying with U. S. Bureau of Mines specifications has been used for coating the entries but gypsum dust has since been adopted. Adobe dust is used for shelf barriers and for side and entry mouth placements.

At all side entries, water sprays are placed and loaded coal cars are drenched before they are sent to the main

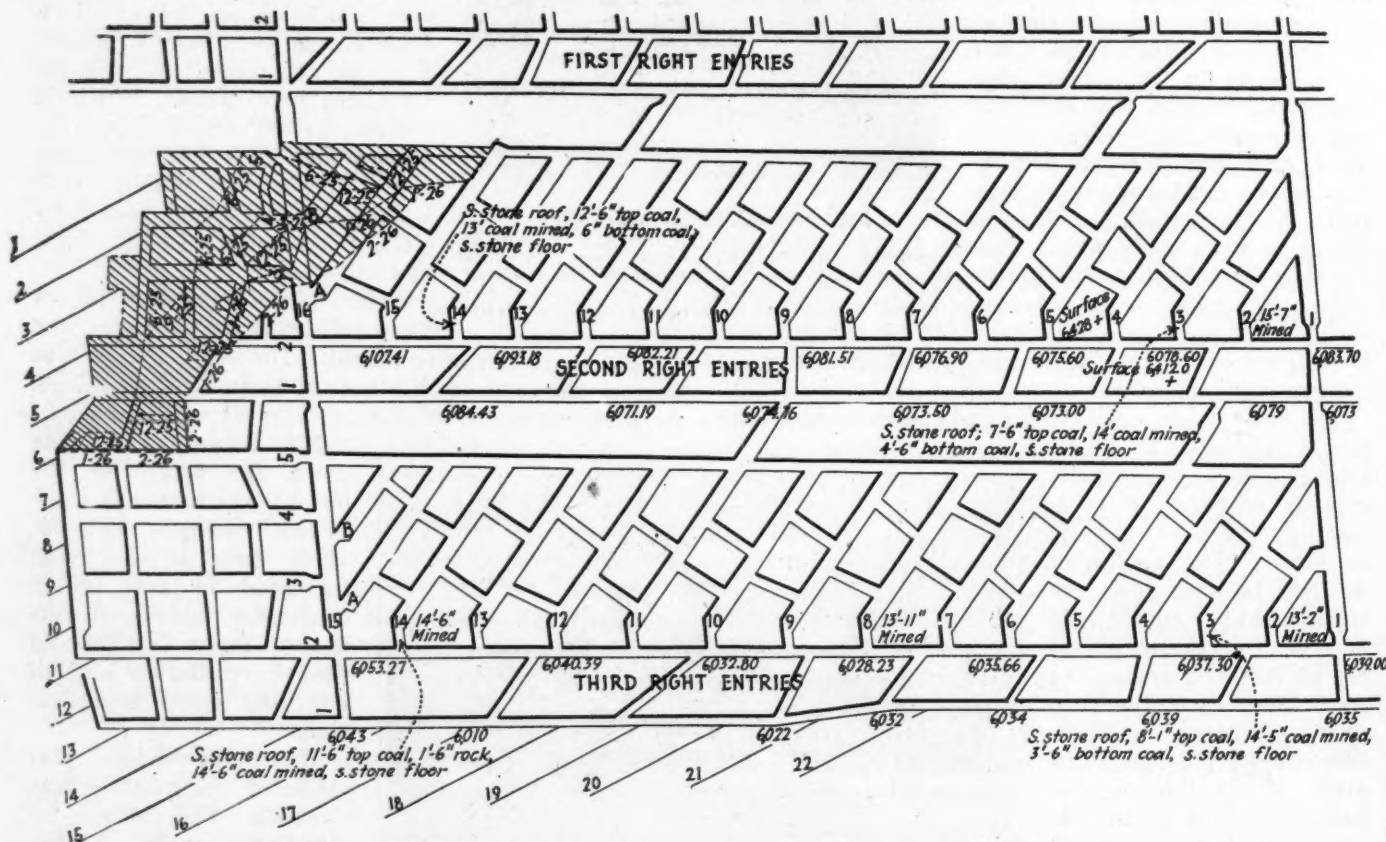


Fig. 4—Typical Working in Castle Gate No. 2 Mine Showing Rooms with Pillars Being Removed

Here the line of break is at quite an acute angle to the direction in which the rooms have been driven. The break lines

as indicated on the left margin have not been closely followed, but doubtless will be later when the work has progressed further and more room is accordingly provided. The cover is about 350 ft. Letters A and B are the "numbers" of rooms.

parting. All empties are drenched as they pass under an automatic spray on leaving the tippie. In the rooms and in all open places, a pipe system and hose outlets afford means for wetting down broken coal and the cutter bars while in operation.

In each working place the miners are supplied with a 50-ft. hose and are required to keep the working face wetted down at all times. The coal is sprayed well before it is loaded and during loading operations. After a car is loaded the top is wetted down before it is removed, and the driver is not permitted to haul the car unless this is done. Machine runners are discharged if they cut without using water on the cutter bars. It is estimated that about half a ton of water per ton of coal removed from the mine is used in this work.

HUMIDIFICATION FRUITLESS

Humidifying, or air-conditioning, sprays are in use on return aircourses and to some extent on intake airways, but air conditioning appears to be one of the most difficult problems.

The general use of water spraying in rooms and on cars contributes in a measure to an increase in the moisture content of the air, but in winter the cold dry air and freezing conditions at the mine entrances bring about a condition difficult to control.

A belt-driven fan with a 200-hp. variable speed motor exhausts air from the mine, the adit haulage, manways and escapeway all being intakes. The water gage of the mine stands at 3.1 in. Despite the excellent ventilation every care is taken to guard against gas. The Burrell gas tester is used for ascertaining the presence of methane, flame safety lamps being used by firebosses on inspection work. These are equipped with relighting devices and magnetic locks. All underground men are provided with storage-battery cap lamps. Charging equipment is installed in a separate building close to the mine entrance.

The mine haulageway or adit is equipped with trolley wire for the mine locomotives. This wire is, of course, supplied with direct current which is furnished by a motor-generator in the fan house. All the other electrical equipment in the mine is operated by alternating current. The main power cable is armored and lead-covered. For further safety it is placed in the escape-way and buried in a trench.

Transformers reducing the potential to 220 volts are placed in a concrete box at each entry. A switch and current breaker are placed at each of these transformers. The system is so arranged that trouble on any one entry does not interfere with the power supply on other entries. The power cable for this service also is laid underground, and machine outlets are provided, 1½ ft. above the floor. Plug switches are used to make connections with the outlet. No gathering locomotives are used, horses performing this service.

A telephone line leads to the foreman's office underground, and a buzzer system on 110-volt alternating current is extended from this point to all parts of the mine. Signal wires carrying 30-volt alternating current extend down the main slope.

In addition, an independent firing circuit is maintained which should be described: At the mouth of each room is a separate room box from which two insulated wires lead toward the working face. The room box connects with a rubber-insulated cable running along the entry to a locked switch box. A 6-ft. gap is provided which must be plugged in to connect the cable with the cable system leading to the locked boxes.

ONLY ONE SHOT POSSIBLE

This cable system leads to a firing station on the outside of the mine which is provided with a switch that when thrown by hand remains in position for one second and then automatically disconnects the current used in firing. It cannot be thrown in a second time.

All the shotfirers at this mine are certified firebosses. They make two inspections of the working places, the first when they are loading the holes and the second after shooting and before the day shift enters the working place. They go on duty at 9 p.m., taking permissible explosives and instantaneous electric blasting caps with them. They inspect every working place, charge the holes and tamp them with adobe stemming put up in paper cartridges. In the future, all blasts will be cushioned, ground limestone being used as stemming.

In room work and entries, five holes are used on a 6-ft. undercut, three upper and two middle holes arranged like the points of the letter W. Three holes are blasted at one time, the two lower and middle upper. The other two rib or corner shots are blasted on another occasion.

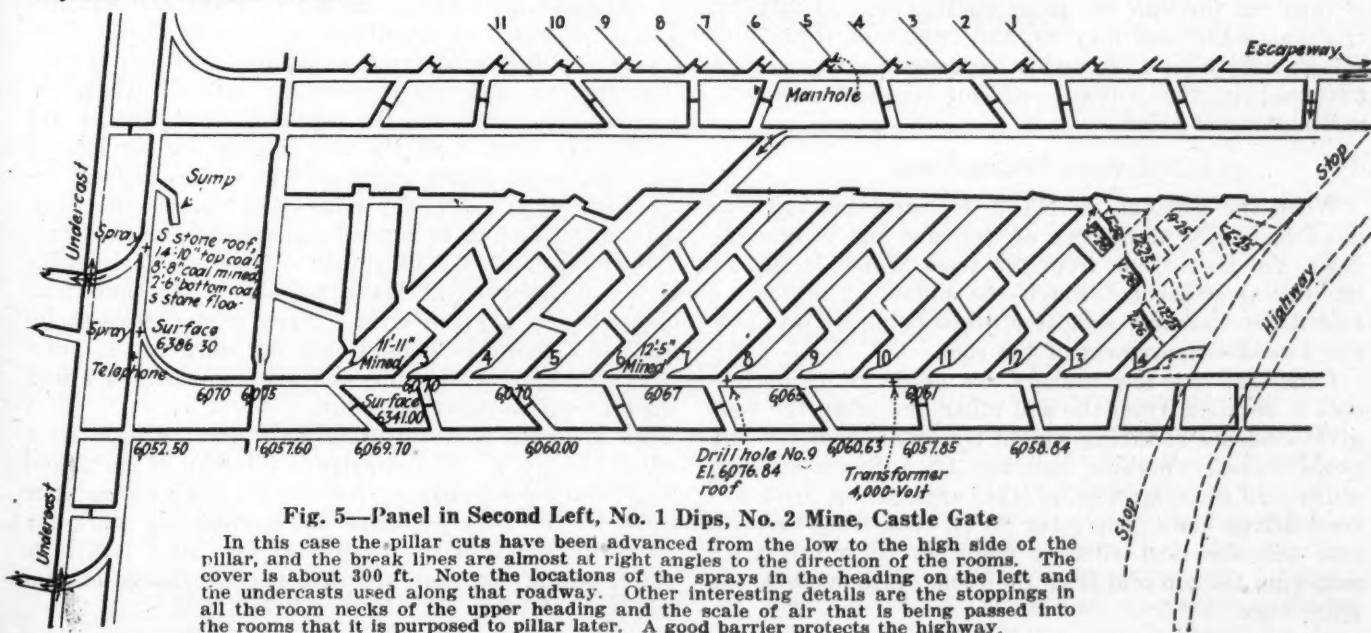


Fig. 5—Panel in Second Left, No. 1 Dips, No. 2 Mine, Castle Gate

In this case the pillar cuts have been advanced from the low to the high side of the pillar, and the break lines are almost at right angles to the direction of the rooms. The cover is about 300 ft. Note the locations of the sprays in the heading on the left and the undercasts used along that roadway. Other interesting details are the stoppings in all the room necks of the upper heading and the scale of air that is being passed into the rooms that it is purposed to pillar later. A good barrier protects the highway.

After completing their tour through the mine and loading all holes, the firebosses return to the surface. The shots are then all detonated simultaneously from the outside, no men or animals being allowed to be in the mine at that time. After eating their meal the firebosses return to the mine to give the working places a final inspection. They disconnect the shooting circuits and lock the switch boxes.

All explosives and blasting caps are carefully checked. The quantity of explosive used in each hole is recorded and reports on the shots fired are made for each district. No explosives are permitted in the mine during the day. Thus timbering, loading, drilling, gathering and haulage are restricted to the day shift and all blasting and general inspection to the night shift. However, during the day working places are inspected by certificated men and all places are examined before they are cut by mining machines. Restricting the work of blasting to firebosses has proved to be an economy as it regulates the quantity of explosive used, and thus the coal produced is better fitted to the demands of the market.

INSPECTION KEEPS MINE IN TUNE

A head timberman inspects haulageways periodically and orders repairs when necessary. The head trackman makes track inspection at intervals, and the head electrician inspects the electrical equipment at regular periods.

Panels are driven so as to leave a barrier pillar of 75 ft. to protect the main entry. Two examples of pillar operation are shown in Figs. 4 and 5. In Fig. 4 the pillar slicing is shown as starting at the high side of the pillar and with the break lines more or less closely paralleling lines which have been established at 50-ft. intervals for that purpose. These cut the rooms at an acute angle. The break lines are numbered consecutively from the starting corner and are marked on the sides of the pillars where they intersect them, thus keeping their alignment continuously visible to foremen and miners.

The general method of pillar attack is shown in Fig. 6. When ready to draw pillars the room which is 7 ft. high is shot to 14 ft. at the top end, leaving 9 ft. of top coal. This is done by an advancing cut. The top coal is then shot at the end of the room and long props placed in position. A crosscut, or drift, 12 ft. wide, is then cut through the pillar 35 ft. from the barrier or cave as the case may be, and from this three successive cuts Nos. 1, 2, and 3 as shown in Fig. 6, are advanced in the bottom coal for a short distance, leaving an end pillar.

NOT MUCH TIMBER USED

When the last cut, or No. 3, is made, the top coal is pushed in by the action of the cave and is brought down and loaded out from the track which is laid in the initial crosscut through the pillar. The coal is loaded out by hand, indicator props being set to show any excessive movement of the roof.

Comparatively few timbers are used. More or less coal is obtained from the end pillar and when the roof gives evidence of taking weight tracks are removed and props pulled, wherever possible, by a Sylvester prop puller. In the meantime, another crosscut, or drift, has been driven across the pillar 35 ft. back from the first cut, and the next slice is ready to be mined after removing the top coal from the room space opposite the pillar slice.

A stepped face with steps about 50 ft., *en échelon*, is made, the furthest advance being along the barrier line. Where the roof or top coal is supported on three or four sides as in the initial work at the corner of a panel it is necessary to cut the coal loose on one side and to start it with shots. Where the coal is tied on two sides the top coal will start by itself. It breaks free from the sandstone roof.

As shown in the plan in Fig. 6, the track is on a slight down-grade in the pillar crosscut. This disad-

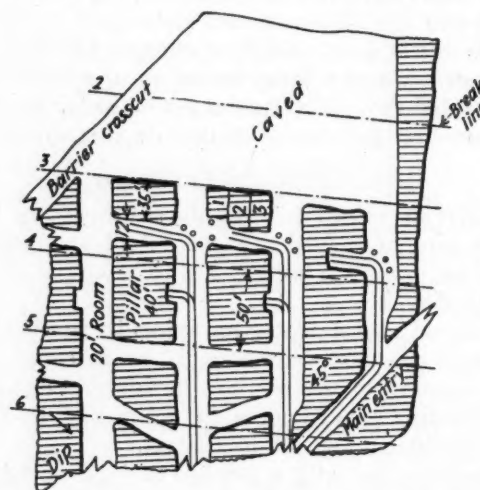


Fig. 6—Detail of Pillar Work, Shown in Fig. 5

The pillars are blocked off as needed by crosscuts which give pillars 35 x 40 ft. Then the pillars are attacked in three slices Nos. 1, 2 and 3 which are removed by driving up toward the barrier or toward the caved area as the case may be. The line marked 3 is marked on the coal pillars and the purpose is to have the break come to that line or be parallel to it.

vantageous situation has been remedied in the plan shown in Fig. 4 where the pillar cuts are advanced from the low to the high side of the pillar. The break lines in this case are almost at right angles to the room length. Hand drills are used with post supports. Short-wall undercutting machines are used on floor cuts wherever possible. All coal is loaded by hand, the average being 14 tons per loader per shift.

Shift reports are made by foremen and firebosses on ventilation, blasting and mine conditions. In addition an excellent practice has been established. Once each month the foreman of a given mine makes an inspection of another mine operated by the company and submits a detailed report of conditions as he finds them. This covers ventilation, gas conditions, rock dusting, sprinkling, trackage and other operating details. These reports are thorough and the results of this practice are good. The Utah Fuel Co. also retains the services of an experienced safety engineer who makes regular inspections of the company mines and advises the management of each as to general and specific practices that will assist in promoting safety. Thus is established a series of independent visualizations of the conditions obtaining in a given mine. Such a plan necessarily leads to a thorough inquiry into the merit of the practices obtaining at the mine and a development of a well thought out working procedure.

E. E. Jones is superintendent of both Castle Gate No. 1 and No. 2. D. Parmeley is foreman of No. 2 and S. C. Harvey foreman of No. 1. An engineering staff under H. R. Ellis performs the engineering work for all of the mines of the Utah Fuel Co. A. C. Watts is chief mining engineer and geologist in charge of coal mines.

Shaker-Conveyor-Loaders Speed Coal Production

Adding Duck-Bill Shovel Mouth Converts Conveyor Into a Loading Machine—Telescoping Sections Give Automatic Feed—Five Faces Are Advanced Simultaneously Giving Large Tonnage — Suits Weak Roof

By H. F. McCullough

Engineer, H. C. Frick Coke Co., Scottsdale, Pa.

SEVERAL DIFFERENT types of substantial and mechanically satisfactory loading machines are now available. They are capable of handling coal at the rate of from one to four tons per minute, but in order that they may be employed to best advantage it is necessary, first, that means be provided for removing the coal from them as rapidly as they can pick it up from the mine floor; and second, they must be continuously provided with an adequate supply of suitably prepared coal ready to be loaded out.

It is now generally recognized that any plan involving the loading of a single mine car at a time will permit realization of only a fraction of the full capacity of the loading machines. Resort must, therefore, be had to some mode of transportation other than mine cars.

Conveyors offer a solution for the first of the problems mentioned; namely, that of taking the coal away from the loading machines as fast as they can handle it. Many types have been developed and used for this purpose. Each is performing, or can be made satisfactorily to perform the service required.

When shaker conveyors were considered for this service, it was recalled that if the forward end of such a machine was lowered to the floor level, and the oscillation of the conveyor imparted to a shovel-like extension on its extremity, any material within the range of the movement would be picked up and carried to the conveyor trough. When material within the reach of the oscillatory movement had been removed, however, the shoveling action, of course, would cease. One manufacturer of such conveyors provided a telescoping section for the forward end, so arranged that when the material within its reach had been disposed of, the conveyor could be stopped, the bolts fastening the two telescoping trough sections together could be loosened, the sections extended, the bolts replaced, and the conveyor again employed in loading out the coal within range of the new setting.

Abstract of a paper entitled "The Shaker-Conveyor-Loader and Its Use in Coal Mining," presented before the "Annual Convention of Coal Mine Officials," held under the auspices of the American Mining Congress at Cincinnati, Ohio, May 24-28, 1926.

It was immediately evident that a machine of this type constituted a combined loader and conveyor insofar as the material lying within its range of movement in any particular setting was concerned. It was also obvious, however, that this was the limit of its dual function, and that to bring it again into operation as a loader, the conveyor would have to be stopped, the telescoping sections unbolted, the end pushed forward into new material, and then bolted up again. This did not constitute mechanical loading in a strict sense of the word, but it was, of course, evident that if some form of automatic feed could be provided for the telescoping forward section a combined loader and conveyor of extreme simplicity and effectiveness would result.

On paper it appeared that this mechanism, which

has been dubbed the shaker-conveyor-loader, was deserving of development and steps were taken to determine where and how it could be applied. In driving headings it was evident that where shooting on the working shifts was permitted, with undercutting and drilling equipment localized in the place being worked, the employment of such a machine would give a continuous cycle of mining, drilling, shooting and loading operations, and that greater efficiency and more rapid progress would result.

Such a device would solve the problem of taking away the material that had been shot down as fast as it could be loaded out, but not that of providing continuously a supply of suitably prepared coal. Only as much material as resulted from one cut in the comparatively narrow room or heading was available at any one time.

Further consideration of the problems involved led to the idea of applying this mechanism to the loading out of long-face coal. By the means about to be described this material can not only be taken away as fast as it can be loaded on long faces, but a large supply of suitably prepared coal ready to load can be kept continuously available ahead of the machine.

Where wide headings are driven, a separate machine, complete with driving engine, may be used for the

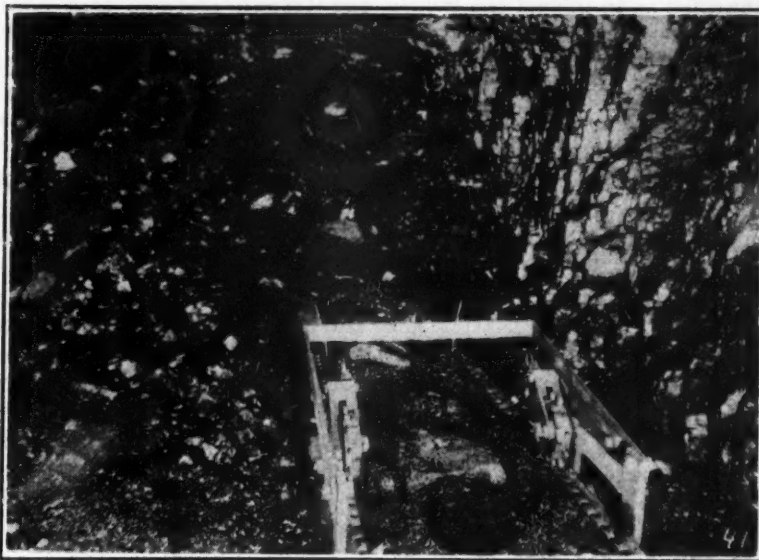


Fig. 1—Shaking-Conveyor Loader Cleaning Up Room

The conveyor does its own digging and is extended automatically by its shaking action. With certain recent modifications, the last 30 ft. of the conveyor can readily be swung 30 deg. to either side of the center line of the conveyor and thus can gather coal from a wide area.

loading operation on the face. This can be arranged to discharge its coal onto the heading conveyor. With narrow headings and generally restricted passages, the shaker-conveyor-loader operating on the long face may be driven from the heading shaker by transmitting the oscillatory motion from one to the other by means of a bell-crank, or pair of rope segments as shown in Fig. 3.

This figure depicts in detail the arrangements necessary for this procedure. The heading shaker conveyor, A, is installed while the heading is being driven. The extension trough B is attached to the end of this conveyor. A fixed relation is maintained between the drive gear C and the end troughs of both headings and face conveyors, this drive being so connected as to impart the oscillating motion of the heading conveyor troughs to those composing the conveyor along the face.

The shaker-conveyor-loader proper consists simply of a section of conveyor trough E, either with or without a flattened shovel end F, and another section of trough G into which it is nested. The automatic feed device H serves either to maintain a fixed relation between troughs E and G, or to move E and F either forward or backward in relation to G.

FEEDS FORWARD AUTOMATICALLY

At the beginning of loading operations the trough E is set at the backward limit of its travel range in trough G which, in turn, is bolted to the first conveyor trough K, so that the rear end of trough G meets the forward end of trough K. The conveyor is started, and the shovel end is pushed into the pile of shot-down coal by throwing the automatic feed into action. This forward movement can be continued at any desired rate of speed until the travel equals the length of one conveyor trough. The connection between troughs G and K is then broken, trough E retracted on trough G to the limit of its travel, and both troughs are moved forward together to permit insertion of another trough. This is put into place and connections made. The conveyor is then started and its forward movement into the coal continued.

Either or both of two difficulties have been encountered with most longface loading schemes—either the devices employed were too complicated to be practicable, or the space required at the working faces exceeded what could be kept open under the roof conditions prevailing. It is difficult to conceive of any loading device that is simpler than the shaker-conveyor-loader. Furthermore, with it, when employed in long-face loading, the span of roof to be maintained along the working face is reduced to a minimum—it need be only equal to the depth of the undercut. Furthermore, additional rows of timber may be set between the break row and the face. Only the conveyor need be cleared, and this

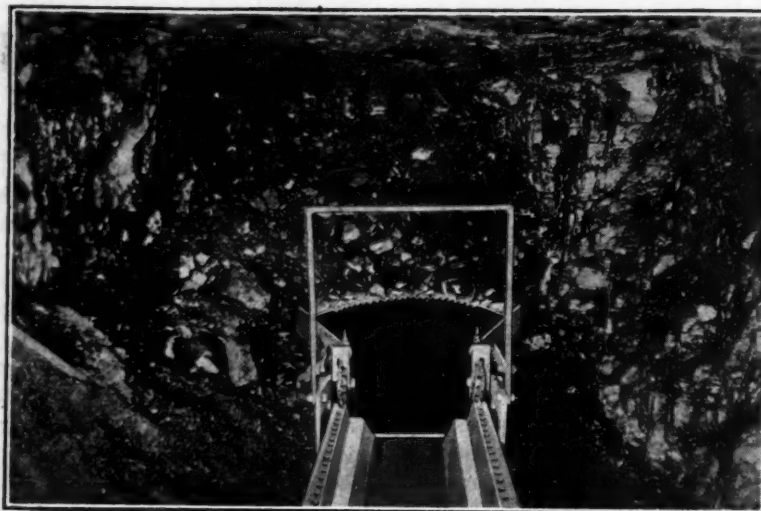


Fig. 2—Conveyor-Loader Feeding Forward Into Coal

The handle can be seen by which the feed of the conveyor is put into or thrown out of operation. A ratchet that will work in either direction advances or retreats the digging section.

is ordinarily about 2-ft. wide.

One plan of procedure that may be followed in longface loading with the shaker-conveyor-loader is shown in Fig. 4. This may be described as follows: A long-face panel is so arranged that five separate faces are being worked at all times. Of course, the development necessary to keep pace with them is carried on simultaneously. Face F is shown in the first stage—the coal has been shot down and is

ready to be loaded out. The undercutting machine and conveyor pans that are needed along this face are stabled in the adjacent heading as shown. The coal lying at X is shoveled directly into the heading conveyor and space thus cleared for the automatic telescoping trough sections that constitute the loader. The drive gear is placed near and coupled to the junction troughs, and the loading out operation is ready to start.

At face E the second stage is shown. The shaker-conveyor-loader is in place and ready for operation. The forward end of the machine is started into the pile of coal that has been shot down by throwing the automatic feed gear into action.

At face D the third stage has been reached. As soon as a part of the coal has been loaded out the mining machine may begin making the next undercut. During this operation the helper or scraper may throw the bugdust directly into the conveyor. Following the machine the shotholes may be drilled, charged and tamped. By this means all preparatory work for the next cut can be completed shortly after the loading out is finished, as illustrated by face C. As soon as the new line of props is set the face may be shot and loading out started over again. Practically continuous operation and production are thus attained.

The fourth stage is shown at face C. All the coal

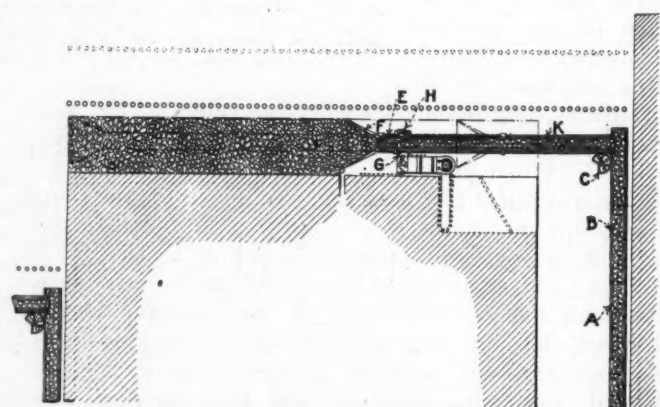


Fig. 3—Conveyor Loading Face Coal and Longwall Machine Cutting Coal for Future Loading

A trough E is nested in trough G and is worked forward at will into the coal pile. The conveyor line A and B along the pillar on the right travels forward rapidly and backward slowly, actuating the sector C which gives a like motion to the face conveyor K and the loader F, thus causing coal to flow in the trough.

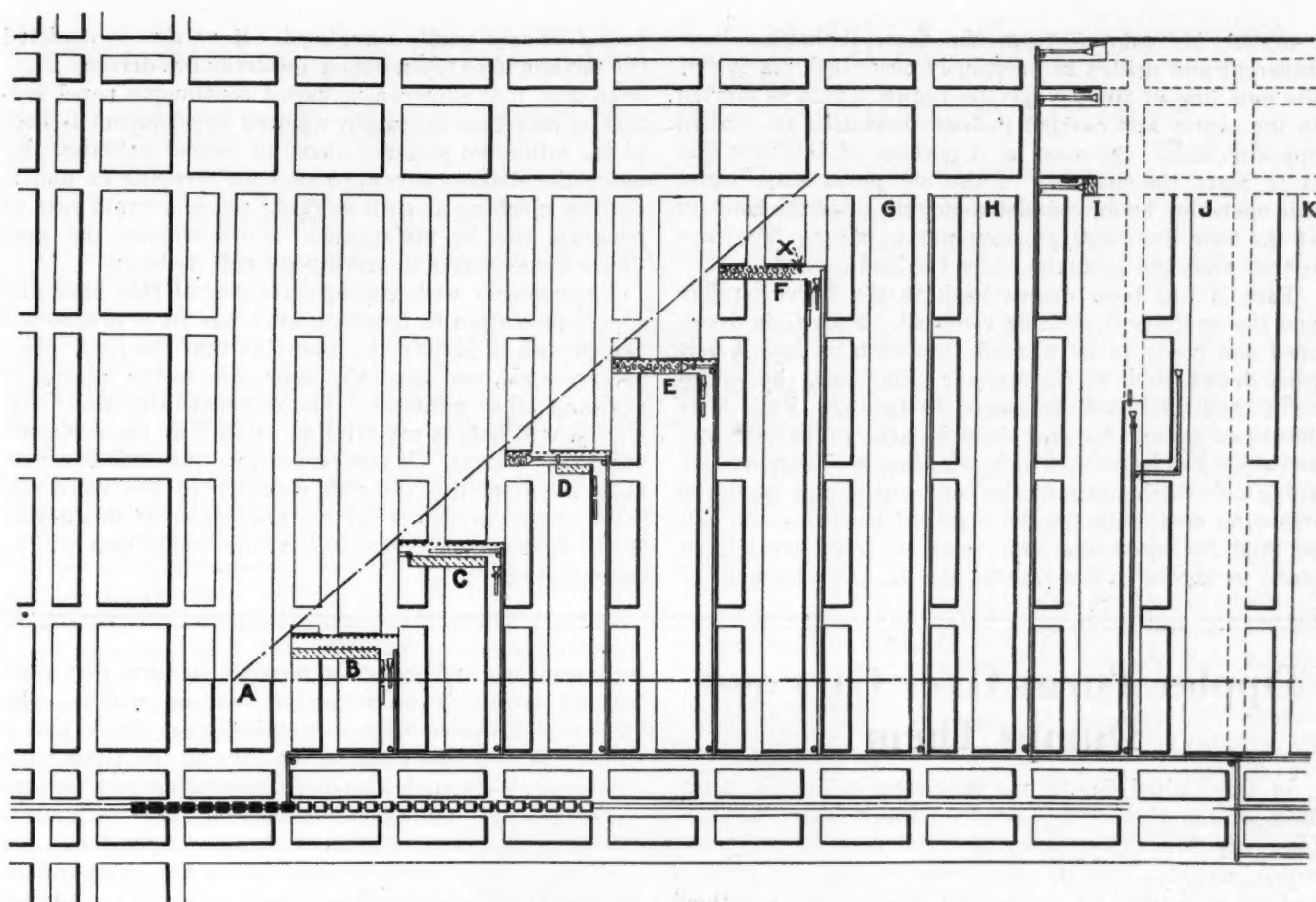


Fig. 4—Conveyor-loaders Working on Five Faces, All at Different Stages; also Driving Development Headings Preparatory to Starting Faces

At *F* the coal is shot down ready for loading and the coal in a space near the heading conveyor has been loaded out by hand to prepare for the first length of conveyor. At *E* the conveyor-loader is starting to clean up the coal. At *D* several lengths of conveyor have been installed and the place is nearly cleaned up. The longwall machine has started its cut

and is nearly half way across the face. At *C* the coal has all been loaded. The head of the conveyor has been transferred to storage in the heading. At *B* the coal is completely cut. The face conveyor is entirely dismantled and stored in the heading. The mining machine is stored with the face conveyor. In *B* the break row has been

moved over to the new face beginning at the center. The coal will be shot or is allowed to fall. At *A* the coal has been drawn back to the stump line. The equipment at *A* has been moved to *G*. Other conveyor-loaders are shown driving development work in two directions at right angles. These are at various stages of operation.

has been loaded out, the conveyor-loader removed from the face and stabled in the heading. Beginning at the forward end successive sections of the trough are disconnected and dragged over those yet in place to the

heading and there stowed. When the undercut has been completed the mining machine is likewise brought back to the heading.

The fifth stage is shown at face *B*. As soon as the

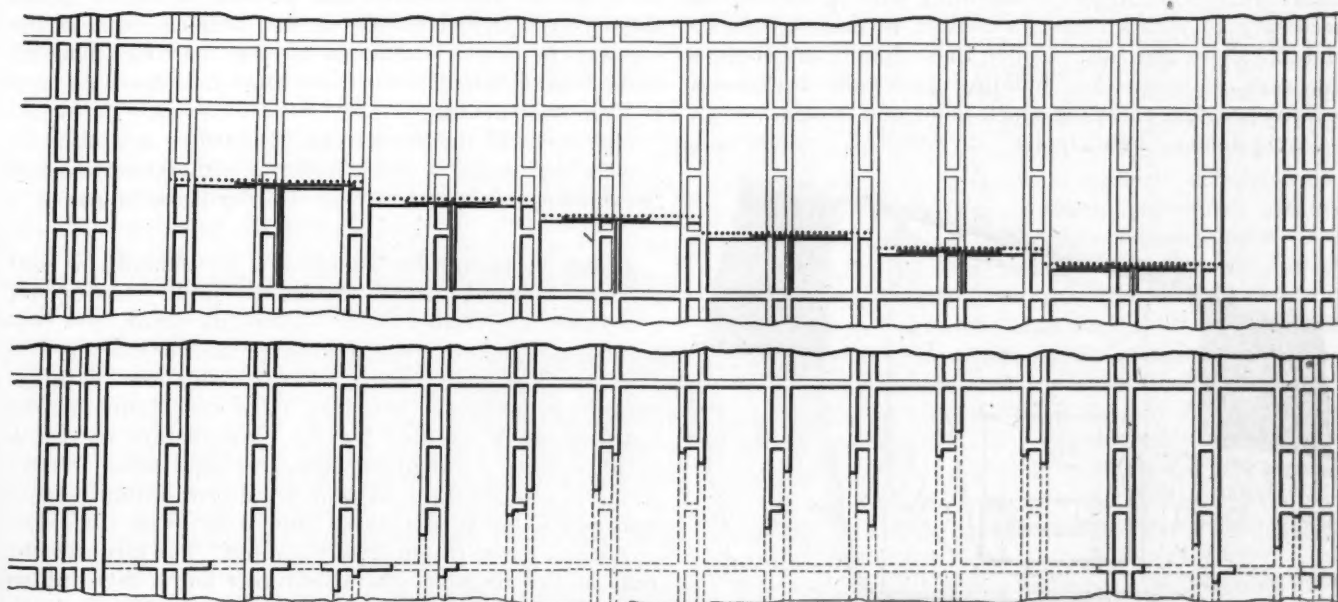


Fig. 5—Proposed Continuous Panel System with Long-Face Operation

Shaking-conveyor-loaders are working on these faces in two directions. The steps are shorter and the faces longer than in Fig. 4. By using a long wall undercutter at

each face, a rapid rate of progress can be maintained. The conditions of the working faces will be thereby improved and the area of development reduced. Both these

conditions favor economical operation and facilitate proper supervision. The longer the conveyor line the more it must be left to run itself.

conveyor is removed from the face, it having been undercut and drilled as previously described, placing of the new line of timber may be begun. This is started in the center and carried in both directions or toward opposite ends. As soon as a portion of the new line is in place the drawing of the old props may begin, this operation being completed shortly after the timbers of the new line have all been put in place. The face is then shot and is again ready for loading out.

Face A has been drawn back to the barrier pillar and the equipment entirely removed. Face G is developed and ready to be worked. As soon as face B has been drawn back to the barrier pillar line, the equipment used on it will be moved to face G. Face H is developed except for the short lengths of barrier and aircourse headings in which working is shown as still going on. Such parts of the conveyor as are employed removing coal from the development headings and can be used for conveying that from the face are left in place, as shown in the case of face G. Development of

face I is only partly completed. Here also is depicted the method used when double headings are driven.

In Fig. 5 is shown a proposed continuous panel system of long-face operation wherein development is kept at the minimum distance ahead of second working. By using the shaker-conveyor-loader and keeping an undercutting machine at each working place, a rapid rate of progress can be maintained. Furthermore, the area under development is correspondingly reduced.

Experiments with conveyor-loaders of this kind and their application to longface workings have progressed far enough to justify the assertion that the basic ideas are practical, and generally applicable to the mining of coal and other minerals. The automatically advancing trough will handle material as rapidly as the conveyor will take it away. It can be fed into the coal at a rate such as to utilize the full capacity of the conveyor. What is now needed is further adaptation of this device to the various conditions and arrangements that will be encountered.

Tippler Turns Over Cars and Dumps Them

In the United States not much backfilling is done. Most of the rock is deposited on the surface, and the following device for dumping mine cars in the mine would probably find its usefulness on the rock dumps and not underground.

The Iron and Coal Trades Review, of Great Britain, describes this device in the issue of July 30, 1926. David John, a miner, working in the Ton Phillip Colliery, Kenfig Hill, South Wales, is the inventor. He devised it to facilitate the handling of slate and refuse used in packing and waste disposal on the longwall face. In some parts of the anthracite region it might find applicability to the needs of collieries where rock is stowed inside instead of being hoisted.

When working the seam at the Ton Phillip Colliery which is about 3 ft. thick, in order to gain sufficient height in the headings for handling cars it was found necessary to take up enough bottom to make a height of 6 ft. above the rail. Under these conditions emptying cars of waste for building packwalls became a serious problem entailing much labor and expense.

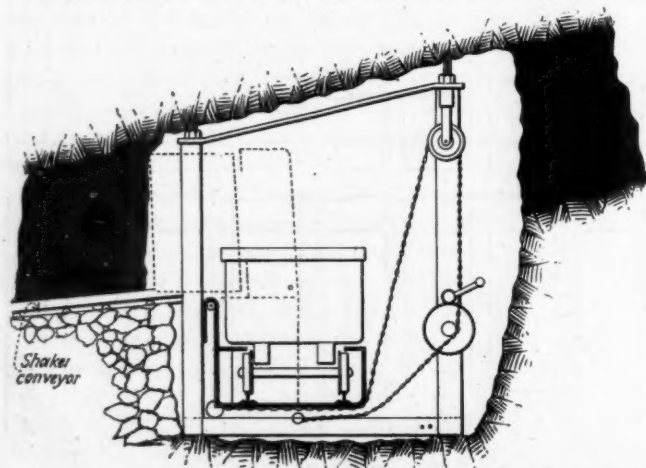
David John's "Tub Tippler" obviates this expense and

inconvenience and makes it possible to turn cars over without requiring an excessive heading width. The tippler is provided with a standard-gage track and a runway is provided to place the cars on the tippler for dumping. With such a tippler discharging rock several feet above the track, one location of the mechanism will serve for the dumping of rock for some time. In dumping from a road elevated above the surrounding country, the tippler could be turned around, thus adding to the scope of its operations. Its greatest availability would, however, be where the dumping track lay along the brow of a high steep hill.

The car to be tipped is pushed onto the carriage and is then dumped by means of the chain or rope and hoisting drum as shown in the illustration. The hoisting drum turns with its shaft but is free to slide horizontally along it, so that the rope or chain may be kept perpendicular to the drum shaft.

To prevent the carriage turning completely over and also to haul it back into place, another chain or rope is attached underneath and passing under a guide sheave is fastened to the drum. Where used on the surface the tippler itself, not having the roof on which to be braced, would itself have to be held down to keep it from overturning.

Movement of the tippler can be aided by setting it on wheels and laying a track under it either more or less permanently or when moving it from place to place.



Picks Cars Up and Turns Them Over
Illustration shows limit of travel due to height of bottom, but for wasting purposes on the rock dump the tippler would turn a car far enough over to entirely discharge its contents.

Lesser African Coal Fields—In Nyasaland, in East Africa, several small isolated fault blocks of coal-bearing Permo-Triassic sediments occur, the contained coal beds having aggregate thicknesses of 6 to 22½ ft. The coals range in rank from low- to high-volatile bituminous coal, that from the Mount Waller coalfield being suitable for the manufacture of metallurgical coke. Swaziland, also, contains some Permo-Triassic coal, ranging in rank from semi-bituminous to anthracite, but occurring in beds of no great thickness.

Algeria's coal resources are limited. The largest field, that of the Kenadsa basin, contains but a few million tons of a low-volatile coking bituminous coal of Carboniferous age. The much smaller Marceau coalfield of Tertiary age, is reported to contain but a half-million tons of exploitable sub-bituminous coal.

Automatic Sectionalizing and Reclosing Devices Protect Mine and Reduce Outage Delays

Dangerous and Costly to Attempt to Correct Short Circuits and Excessive Loads from Substation Only—Separate Feeders Are Costly, Inefficient and Not as Safe as Sectionalized Network

By E. L. Hough

Switchboard Department, General Electric Co.,
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SO SPORADIC is the growth of a mine, so difficult is it to determine in advance what loads must be carried and where they will be located that it is often impossible to plan an economical and satisfactory feeder system in advance of operation.

When a mine is first opened a single generating or conversion unit feeding through a single circuit is usually more than adequate to supply the power requirements. As the mine grows the power supply must be augmented by additional power-producing or conversion units, and the feeder system is spread out to include all of the main haulageways, working faces and other locations where power is required.

Usually, the line of least resistance is followed, and the entire mine distribution network is tied solidly together, extensions being made as required. This results in prolonged tieups of the mine in the event that a wreck, slate fall, or other accident short-circuits the system. This practice also materially increases the fire hazard, particularly at the working faces—the most dangerous locations in a mine.

As mines grow in size it has been found to be essential that means be provided for localizing the troubles from short circuits. Frequently, manually operated lever switches ("sectionalizing switches") are installed, so that when trouble occurs an electrician can isolate the section in difficulty. This is usually a slow procedure, as it is necessary for the electrician to locate the trouble in the mine, pull the sectionalizing switch and then report to the substation so that the operator can reclose the circuit breaker to re-energize the trolley and feeder system. This method of procedure usually consumes valuable time, during which the output of the mine is interrupted.

In some cases automatically tripped circuit breakers have been used in place of manual switches, but this method entails much delay also because all circuit breakers between the trouble and the substation are tripped when a short circuit occurs, even though graded overload settings are used. It is also necessary to reclose these breakers manually, and frequently men are not located near these breakers so that it is necessary to detail a man to this particular work. Short circuits and overloads on mining circuits are of frequent occurrence. Records of automatic reclosing equipments indicate that it is not uncommon to have

the substation breaker trip from 40 to 50 times daily.

To overcome many of the objections to the schemes outlined, not a few of the larger mines have permanently sectionalized their mine distribution circuits and feed the independent sections through separate feeders direct from the substation. Each feeder circuit is protected by a circuit breaker in the substation where an operator is available for closing the breaker.

This method provides good protection to the individual sections and prevents tieups of the entire mine resulting from trouble in a particular section, but it possesses several objectionable features. In common with the schemes previously described, it does not reduce the fire hazard at the working face because it is not usually possible to set the substation breakers at a point low enough to trip positively when a short circuit occurs at the farther end of a long feeder while still allowing sufficient power flow to supply peak load demands.

The trolley wire installed in side entries and rooms is usually small, and frequently the track is not bonded, thus giving a high resistance circuit from the substation to the working face. The current drawn through such a circuit by a short is sufficient to start fires in the rooms, but frequently not sufficient to trip the substation breaker.

Furthermore, this scheme entails the use of much heavy feeder copper

if proper working voltages are to be obtained, and this copper cannot be economically utilized because of the arrangement of circuits. The best use of copper in a distribution system is made when the feeders and trolleys are tied together to provide several parallel paths. The individual section system also does not usually allow sufficient latitude in the addition of new mine supply areas without eliminating the advantages obtained from this system of distribution.

It has been appreciated for some time that an automatic means of sectionalizing in case of trouble and automatic restoration of service when the fault has been removed was desirable from many standpoints, but the expense involved in using existing designs of automatic reclosing equipments prevented their extensive use for this service.

For some time railway systems have used sectionalizing equipments on their distribution circuits, and many companies have reported phenomenal savings in expense and improvement in the quality of service.

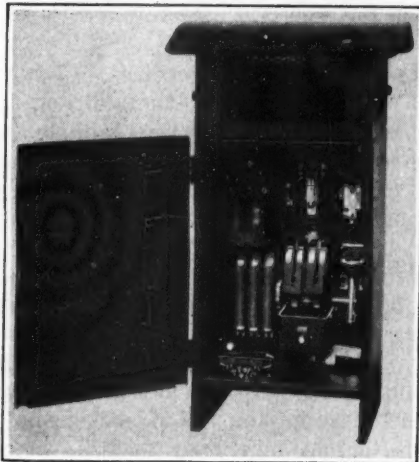


Fig. 1—Automatic Sectionalizing Equipment

This device is placed along the circuit. When there is a ground, a "short" or an overload, the current is cut off but is restored after a time delay if load conditions become normal. Being on the spot it does not need to be set to trip on such a dangerously high amperage as would be necessary if placed at the substation.

Where equipments were used on multiple circuits to tie together two sources of power, they were not arranged for reclosing on load under stub-feed conditions; that is, where the load is supplied by a single source of power. Such an equipment is not entirely suitable for general mine conditions, as most mine

The use of automatic sectionalizing and reclosing equipment in a network permits taking advantage of all the operating economies of the solid network and in addition provides for limiting the extent and duration of outages caused by short circuits. It also reduces the fire hazard materially, because the sectionalizing units may be set to trip at lower values than the substation breakers.

Study of, and experience with, automatic sectionalizing and reclosing equipments for inside-of-mine service has indicated that these equipments should have the following characteristics:

(1) They should trip on overload. (2) They should reclose after a time delay. (3) They should reclose when load conditions become normal under either stub or multiple feed in either direction. (4) The tripping and time-delay adjustments should be independent. (5) Equipment should require no separate source of operating power. (6) Equipment should be suitable for underground

service. (7) Accident hazard should be minimized. In addition, it is desirable that the equipments be strong, simple and easy to install. The equipment shown in Fig. 1 is designed to meet these requirements and many of this type have been installed. The wiring diagram (Fig. 2) shows the connections for the equipment, each device having a number which designates the function which the device performs. These numbers have been standardized by the Electric Power Club and are now in general use by manufacturers of automatic switching equipment. They are used on the wiring diagrams, in the instruction books, and the devices are identified on the panel by metallic numbered plates.

The overload trip is obtained by a series-type, direct-current overload relay, No. 176, the coil of which is connected in the main power circuit. Adjustment is easily made to allow tripping from 100 to 250 per cent of the equipment rating. For example, a 600-amp. sectionalizing unit may be set to trip at any value from 600 to 1,500 amperes. When a short circuit or overload occurs the contacts of this device open the coil circuit of the line contactor, No. 172, directly and thus open the main circuit.

In order to allow an interval for the removal of an accidental short circuit or overload and to allow pumps and other rotating machinery to come to rest so that the load to be obtained on reclosure will be properly indicated, it is desirable to have a short time delay between the opening and reclosing of the circuit. This is obtained by means of a time-delay interlock which is operated by the main line contactor. When the contactor is closed the bellows of

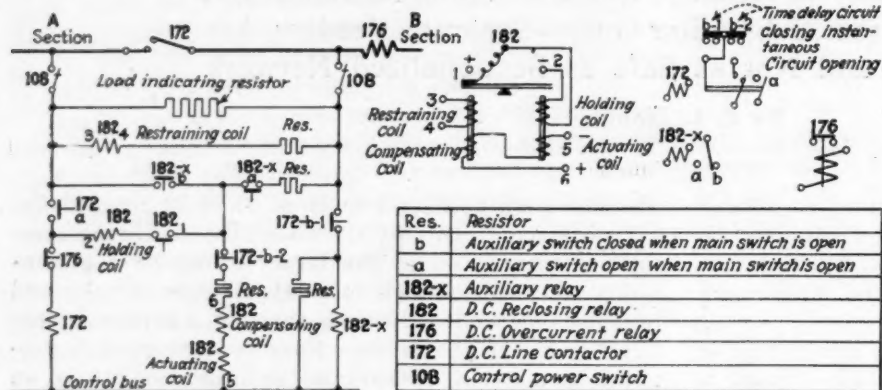


Fig. 2—Makes Grounds Less Likely to Set Fire to Coal

Much time is lost by outages at mines. When an overload, a short circuit or a ground occurs, the circuit breaker goes out without any indication of the location of the trouble. With automatic sectionalizing equipment, the condition is promptly corrected if the condition is temporary for the circuit is automatically re-established, and if the trouble is more serious and needs an electrician this equipment makes it possible to place limits within which to hunt for the trouble.

circuits may be called upon to operate under either stub or multiple conditions.

The advantages to be derived by the use of a similar design of equipment in mining service are quite evident, but a brief review of this phase of the subject may clarify somewhat the application of such equipments. In order to obtain the maximum use of all conductors in a distribution network, such as a mine trolley and feeder system, they should be operated in parallel so that diminution of voltage may be kept to a minimum.

Reduction in operating voltage causes excessive feeder loss because the energy is used up in supplying the resistance drop of the circuit. In actual mine installations, cases have been found where the distribution loss was more than the actual power consumed by the electrical machines. Low operating voltage also results in slowing down and overloading of motors, thereby reducing the output of the mine and materially increasing the burnouts of motor armatures.

Operation of a network which is tied solidly together becomes more and more difficult as the system grows, because of the outages on the entire network caused by trouble on a particular section, as previously described. Therefore, although the solid network is most economical it is not a practical operating proposition. In addition, the use of a solid network necessitates relatively high overload settings on the substation circuit breakers, and this frequently prevents tripping when a short circuit occurs at a remote point in the mine. Consequently, a short circuit in a room may allow the flow of sufficient power to start a serious fire.

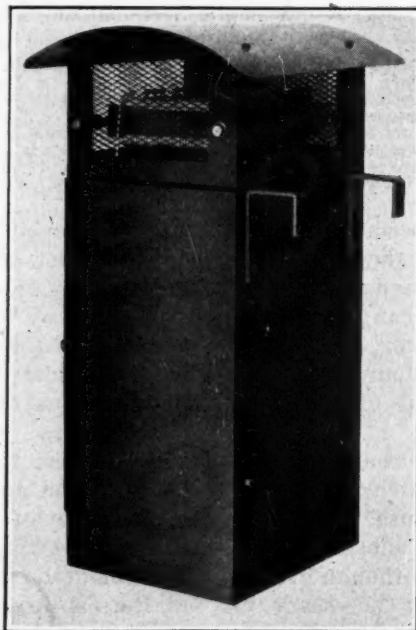


Fig. 3—On Advance Guard

Electrical protection must be close to the job to be efficient. It cannot be located solely at the substation. It must also be sufficiently sensitive. The protection should be gaged to operate whenever the normal demands of a relatively small section are much exceeded.

the interlock is compressed, and when the contactor opens the interlock is closed after the expiration of the time delay for which the bellows is set. This time delay is readily adjusted by means of a small, easily accessible needle valve.

In order to prevent repeated applications of a short circuit or an overload, it is desirable that the circuit be held open until load conditions have become normal. To accomplish this a load-indicating resistor and a direct-current reclosing relay, No. 182, are used. The load-indicating resistor is normally connected across the line contactor, No. 172, when it is open and thus allows a small quantity of current to flow into the load circuit.

This load-measuring current serves to operate the load-measuring or reclosing relay, No. 182. This relay allows reclosure of the line contactor when the load resistance on stub-feed conditions has increased to the point where not over approximately 150 amp. will flow when the line contactor is reclosed. As either side of the sectionalizing equipment may be the "live" one, the unit must be arranged for properly indicating the load and reclosing the line contactor from either side. This is accomplished by means of an auxiliary reclosing contactor, No. 182.

For station-type reclosing equipments it is desirable to have the reclosing calibrations adjustable and the settings for stub and multiple reclosing should have independent adjustments. For sectionalizing units, however, it has been found that these adjustments are not necessary and, as the equipment is simplified by their omission, they are not provided. The equipments are calibrated and set at the factory, and this feature does not require attention when installing.

It is obvious that every adjustment that may be changed by the mine electrician should be as simple as possible and, with this end in view, the adjustments for tripping and time delay have been made independent. Thus, the changing of one does not change the other.

It might be simpler to design an equipment having an independent source of operating power and such a design might possess minor advantages over a standard design. The disadvantage incidental to supplying this separate source and to maintaining it are obvious and would far outweigh any advantage. As a result, the control power is obtained directly from the trolley or feeder circuit itself.

As these sectionalizing and reclosing units are designed for mining work they must be suitable for underground service. With this end in view the entire equipment is inclosed in a dripproof, ventilated steel case which is treated to make it rust-resisting. The relay and contactor coils are specially impregnated to make them moistureproof.

Metallic parts of relays and contactors are made of rust-resisting metals wherever possible and, where steel or iron parts are used, they are sherardized or given other rust-resistant treatment. Relay contacts are made of silver and are so designed as to be self-cleaning. The heat generated by the coils tends to

keep the equipment dried out. The panel on which the devices are mounted is made of ebony asbestos board which is non-absorbent and retains its insulating properties under damp conditions.

In order to reduce the accident hazard to a minimum, the inclosing case is arranged for connection to the rail return or ground and the arc chute of the contactor is completely inclosed. These units must necessarily be mounted where men are likely to be working or passing, and grounding of the case eliminates any possibility of accidental shock. The complete inclosing of the contactor arc chute prevents accidental burns which might be received from the hot arc gases given off when a short circuit is cleared by the line contactor.

All apparatus for mines should be of a simple, strong

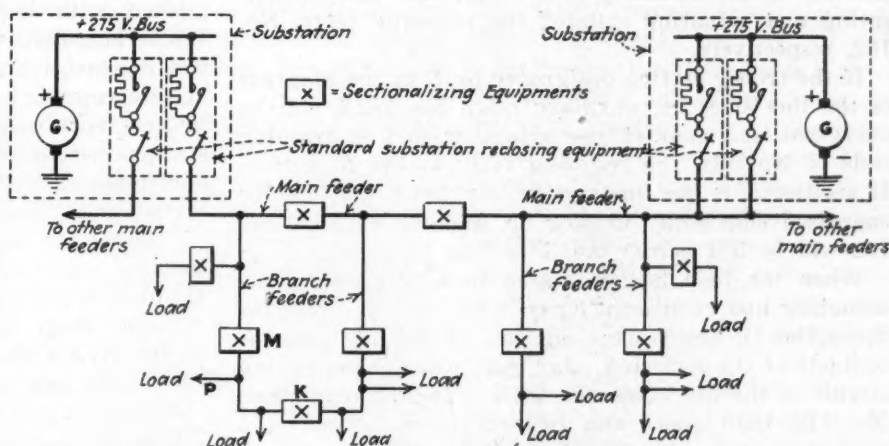


Fig. 4—Way in Which Sectionalizing and Reclosing Devices May Be Used

Here the equipment is well tied together into a network, but the introduction of several of these current-breaking and re-establishing devices prevent an outage over all the network at one time. Furthermore each device acts as a supervisor and corrector of conditions adjacent to it. If it goes out and stays out, it is certain that the trouble is in the section adjacent. No need to hunt the mine over for it.

type in order to allow of its installation and maintenance by an ordinary mine crew and to prevent its damage when being handled in a mine. As will appear from Fig. 3, the case is arranged for mounting on a timber or crossbar by means of two hooks in a manner similar to a small distribution transformer.

Its weight is such that two men can handle it. The case is of heavy-gage steel plate and is sufficiently strong to withstand much rough handling without material damage. The flanges on the bottom permit setting the unit on a flat surface for moving. Each device is chosen carefully for this particular service and the suitability of these devices is illustrated by the main line contactor.

This device was designed primarily for use in steel mills where the service is unusually severe. It has a life of several million operations with no other attention than tip renewal. The electrical connections required are extremely simple. It is only necessary to connect the two trolley sections to the large lugs at the bottom of the case and to connect the third lug to the negative or rail side of the circuit.

The case may be locked to prevent tampering by unauthorized persons. A control switch which may be operated with the case locked permits opening the circuit completely whenever desired.

These equipments operate on a principle similar to the substation type of automatic reclosing equipments which have been described elsewhere. Referring to the wiring diagram (Fig. 2), it will be noted that, assum-

ing everything is normal and the circuit is carrying load, the coil of the main line contactor, No. 172, will be energized through the normally closed contacts of the overload relay, No. 176. The normally closed interlocks No. 172-B-1 and No. 172-B-2 will be open, and the bellows which controls these interlocks will be compressed.

When an overload occurs the overload relay, No. 176, will be energized and its contacts will open, thereby de-energizing the coil of the line contactor 172, causing it to open the circuit. When this contactor opens the load-indicating resistor bridges its main contacts and permits a load-indicating current to flow. After the time delay for which the bellows is set, the normally closed interlocks of the main line contactor Nos. 172-B-1 and 172-B-2 close, and by so doing, energize the coil of the auxiliary relay 182X and the compensating and actuating coils of the reclosing relay, No. 182, respectively.

If the trolley section designated by *B* in the diagram is the line side, the auxiliary relay No. 182X will be energized and connect the actuating and restraining coils of No. 182, the reclosing relay to the *B* section. If section *A* is the line section, No. 182X may not be energized sufficiently to pick up, and the coils of No. 182 will be left across the *A* section.

When the load has decreased to a safe value, the actuating and compensating coils of No. 182 overcome the action of the restraining coil of No. 182 and the contacts of the reclosing relay, which are in the closing circuit of the line contactor, close. The line contactor, No. 172, then closes and restores normal service.

MAIN DIVISIONS ARE ISOLATED

The application of these equipments varies with the service conditions to be met. Some mines are using these equipments on branch feeders only as the main haulageway usually gives less trouble from fallen trolley wires, slate falls, etc., and by this method side-entry troubles are confined to a definite region; the main haulageway being kept energized continuously.

A schematic diagram showing the application of automatic sectionalizing and reclosing equipments is shown in Fig. 4. Each main division of the entire system is completely isolated by sectionalizing apparatus and only the division in which trouble occurs is cut off. For example, suppose a short circuit or heavy overload occurs at point *P*. The sectionalizing equipments at *M* and *K* will open the feeder at these points and prevent disturbance at other load points. When the trouble at *P* is removed, equipments *M* and *K* will reclose as previously described for a single equipment and restore service to this section. Under no conditions will the sectionalizing equipment reclose on a short circuit.

The sizes of equipments used naturally varies with the particular layout. Main circuits require larger equipments than branch circuits. These units are regularly built for service on 300, 600, 900, and 1,500-amp. circuits at 275 volts. Bituminous mines use the 600-amp. size most frequently and the anthracite collieries find most frequent use for those of 900-amp. capacity.

There is little doubt but what these equipments will find a considerably wider application in the future than they have in the past and their popularity will increase as the savings to be made by the reduction in number, size and duration of outages by their use is more fully realized.

Why Utilities Generate Power In City Stations

Whether utilities serving large cities like New York or Chicago should station their plants at the source of coal supply or in the city has been a matter of much discussion ever since high-tension current has been introduced. One Eastern plant is now using 220,000 volts and like tensions are not infrequent in the West. It is interesting to quote what Arthur Williams, vice-president of the New York Edison Co., has to say as to the reasons which have led his company to locate its power plants in New York City:


"Were the power plants located at mines, it would be necessary to use long-distance transmission lines to bring power into the city. Part of this would be accomplished with aerial construction, part underground. While long-distance transmission of electrical energy has reached a high degree of perfection, some danger of interruption remains, and were this method utilized in New York under the existing conditions, local steam stations would probably have to be erected at great additional cost and kept ready to place in immediate operation as reserves to the long-distance system.

"One of the most highly developed long-distance systems of electrical transmission is the publicly owned Hydro-Electric System of Canada, deriving power from Niagara Falls, where, according to the official reports of the Hydro-Electric Commission, interruptions occur frequently and are the cause of deep concern.

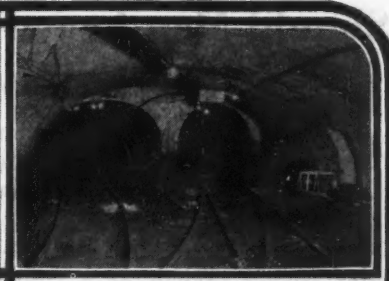
"There is still another reason, which but needs to be told to be understood. A modern power plant, such as we have here, requires great quantities of cold water for condensing purposes, and as a rule, there is at best a very limited supply of water in the coal fields. Probably few realize the magnitude of the volume of water used in these plants. For the purpose of steam condensation, each ton of coal requires 700 tons of water. The pumps of these waterside plants are capable of supplying 2,700,000,000 gal. daily, or three and one-half times the quantity of water consumed by the city for drinking and all other purposes. This, however, is not the water we use for drinking; it is water borrowed from and returned to the East River, coming into the plants as cold as we can get it and going out bearing the heat units taken from the steam, no longer serving a useful purpose.

"Without referring to the availability of competent and experienced workers required to operate these plants if located in the coal fields (for this, taken by itself, could probably be adjusted), there is still another reason which makes the location of huge power plants in the mine fields, of most doubtful desirability. Their supply of fuel would thus be confined to a single mine, or group of mines, within a very limited area, and should this supply be interrupted for any reason, the power plants would necessarily shut down and all electrical service to the city would be cut off.

"At the present time (and this of itself is a very interesting fact) the New York Edison Co. is receiving coal by rail and water from nearly 30 mines, and has also available the foreign markets from which it has already drawn coal for the protection of the city's electrical service several times during past years. Constant availability of an adequate and diversified fuel supply is one of the essentials first considered in determining the location of a modern steam power plant."



Underground Operation



Glogora Mine Uses Simple Automatic Door

Though, doubtless fully "automatic" door, opened and closed from a distance by the movement of trips and constructed with all the perfection of factory technique, would give even better results and have a

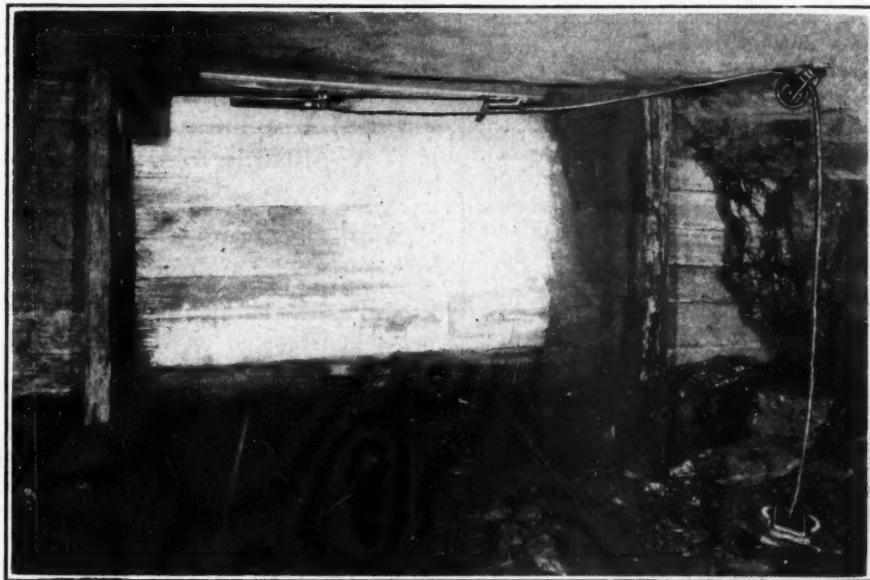
An ingenious and important feature of the design is the use of an open, horizontal sheave, in the frame above the door opening, to engage the cable after the door has opened part way. Without this, the cable

to which the weight is attached would not pull in the proper direction on the door when it stands wide open. The extra sheave brings this pull, when the door is open, at about the same advantageous angle as when it is closed.

To insure that the cable will enter the horizontal sheave each time, the guard or bearing plate of the lower side is extended several inches and is bent down at an angle so as to catch the cable and guide it onto the sheave. Discarded wire rope from cutting machines and worn chain sprockets are used as cables and weights on the particular door illustrated.

C. D. Schlegel, superintendent of the mine, states that he has six of these doors in use. They have been installed for several years but were improved about 18 months ago. On the main haulway there is one door that has not required any repairs for over a year.

The limits of use of this type of door would probably be encountered in mines where the pressure difference is so high as to require extremely heavy weights and where it would be difficult to hold the air leakage to a reasonable figure.



Automatic Door Closed with Weight Resting on Floor

The weight on the other side of the door is in the same relative position, and its cable also is slackened but slightly. As the door opens the horizontal sheave engages the cable and makes it pull at an advantageous angle even when the door is full open. There is a notch, of the same shape as the horizontal sheave, cut in the top edge of the door.

longer life, the Glogora Coal Co. is finding the simple home-made "automatic" door used at its mine at Glo, Ky., gives good service. That is a tribute to the automatic feature. The door is built of wood and hinged at one side for a two-way operation. The locomotive opens the door by bumping or pushing it out of the way, and it is closed by a weight which was raised when the door was opened. There are two weights, one on each side. That on the outby acts to close the door after trips have gone inby and that on the inby to close it after trips have gone toward the mine mouth.

The door is held closed against the air pressure by the weight of the counterbalance and by adjusting the length of the cables so that both weights rest on the floor with only a slight slack when the door is closed.



Locomotive Passing Through the Door

On each side of the door there is a renewable bumper board which takes the wear. In the position shown in this illustration the door has opened just to the point where the cable is being engaged by the horizontal sheave. The weight has been raised to a point level with the top of the locomotive frame.

Should Men Leave Mine When Temporary Seals Have Been Built?

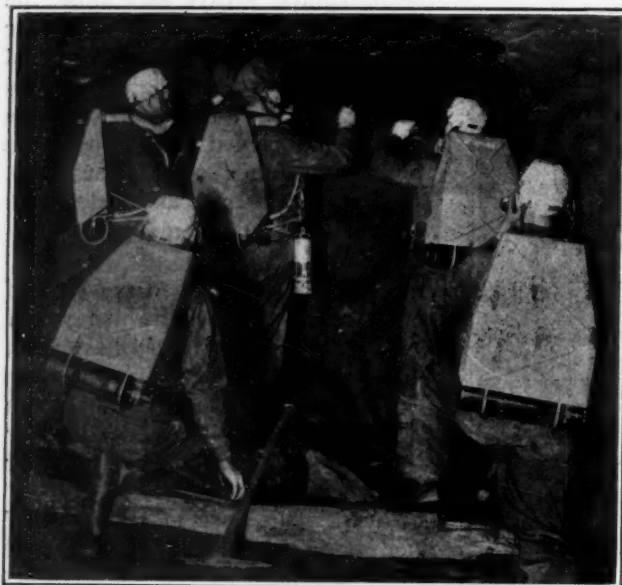
Seeing that explosions frequently follow the erection of seals it might seem the part of prudence to remove the men for some time after the temporary seals are erected for fear the mine should explode as a result of the sealing. "Should the men wait to complete permanent seals after the temporary seals are completed or should they be removed from the mine for a certain period upon completion of the temporary seals?" This question in effect was asked by J. T. Ryan for the benefit of the Operating Officials' Convention held

which an explosive mixture would be developed within the seals."

Fourteen bituminous engineers would build the permanent seals immediately following the temporary seals. Some would not trouble to make the temporary seals airtight and some would not put up any stoppings that were of a temporary character. Eight engineers would order all men out of the mine as soon as the outbreak of fire was discovered. Twelve would be guided by the gas conditions, and twenty-four advocated removing the men for 3 to

race between the oxygen going down and the methane going up, because if these two curves cross within the explosive curve there is bound to be an explosion, the magnitude of which will depend on the mixture and the volume. After 12 hr. have elapsed and nothing has happened it is safe to return and build the permanent seals. This can be accomplished without much danger of an explosion, provided that enough air is directed against the temporary seals to dilute, to a point below the explosive limit, the gases that may be seeping through the stopping.

"Gas samples should be taken from the pipe in one of the temporary seals and these should be analyzed to learn the condition of the atmosphere back of the seals before starting work on the permanent stoppings."



Apparatus Crew

Seal is not entirely closed. Sufficient men are engaged so that should one of them have difficulty with his apparatus there will be others to take care of him. The apparatus crew should leave as soon as the temporary seals are completed, according to Mr. Ryan, for that is the critical time at which an explosion may be expected.

Are Moffat Tunnel Methods Applicable to Mines?

When roof has to be taken down to a considerable height for loading out by machine, why could not the shooting be done by a series of upraises, as at the Moffat Tunnel now being constructed on the Denver & Salt Lake R.R.?

When on stable ground the width of this tunnel is made 10 ft. in the first operation, the height being 11 ft. By drilling, the tunnel is widened to 16 ft. Then shots were put in the roof to increase the height to 18 ft., 7 ft. of rock being shot down. This is not loaded out but allowed to lie. It stands about 7 ft. below the temporary rock roof.

Other shots are then fired and the rest of the height attained, namely 24 ft. The rock is all loaded out at one time. Thus not only are the drillers given a base on which to stand, but the compressed-air excavator is given an adequate job to perform. In shooting down it is well to shoot to the full height and then load instead of shooting and loading alternately. Of course, this could be done only in fairly stable ground.

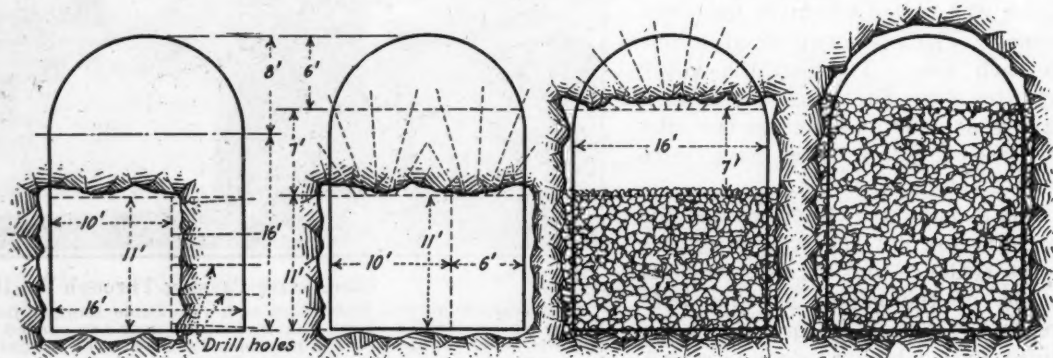
by the American Mining Congress. 36 hr. after first seals were built.

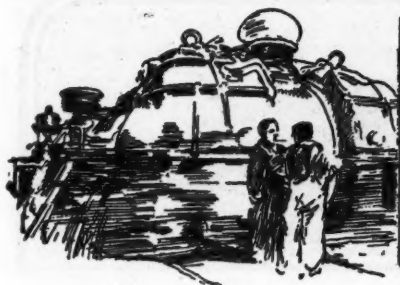
The question was answered in several ways by anthracite authorities, but these two citations cover them all: "(1) If the temporary seals are fairly tight I would remove the men for 12 hr. before starting on the permanent seal"; "(2) Remove all men, other than officials, from the mine on the discovery of fire. Whether to remove all men before placing permanent seals would depend on an indefinite time factor, this being the probable period in

Mr. Ryan's opinion is unequivocal. "The first seals erected should be temporary but fairly substantial, preferably of non-combustible materials but of such material as will make it possible to erect the stoppings quickly. As soon as they are completed, get to the outside as quickly as possible and if you run you should not be criticized. The critical moment appears to be within a few hours after the air is taken off the fire or during the time of the

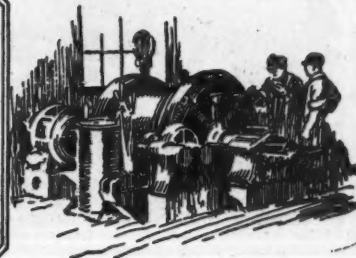
Excavating Moffat Tunnel

Four stages in the tunneling. The rock from the first round of roof shots is allowed to stand so as to form a base for tackling the rock above.





Practical Pointers For Electrical And Mechanical Men



Multiple Conductors Need Tie Connections

To obtain highest efficiency from a network of electrical conductors requires paralleling at every point of feed and distribution. A common example of this is a large feeder paralleling a trolley wire, say a mile in length. If this feeder is connected to the trolley only at each end, then it does little toward reducing the loss to a locomotive operating over the section. Its help will be effective only near the end farthest from the generator.

The ideal condition is to have the feeder and trolley combined in one wire, which condition is practically attained when both are attached to the same hangers and therefore connected electrically at each suspension.

The accompanying illustration shows that the necessity for paralleling conductors was not overlooked at the New Orient mine of Illinois. The photograph is a view looking down into a manhole at the six 1,000,000-circ. mil bare negative conductors which are carried in fiber ducts under the floor of the underground substation.

In this manhole, connection is made to the negative of a 250-volt motor-generator through a short conduit at right angles to the main. There are three other manholes in the substation serving the same to the other machines, and in each the

six cables are similarly tied together.

The connection consists of a heavy copper strap clamped by pairs of U-bolts to the three conductors of each duct. In addition the cables are thoroughly soldered to the strap. These parallel connections made at each point of negative feed (more commonly termed negative return) insure that each of the six main conductors do their share toward holding the transmission loss to a minimum.

Illinois Mines Are Using Arc Soldering Irons

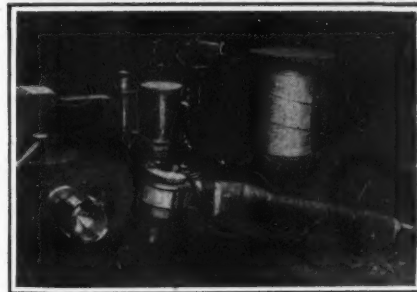
Continuous application of heat to the iron is the ideal condition when soldering a heavy job such as a large commutator. One way of obtaining such heat is by means of an arc-heated electric iron.

Homemade soldering irons of this type have been used for the past eight years in repair shops of the Chicago, Wilmington & Franklin Coal Co. One of these irons is shown in the accompanying illustration.

The goblet-shaped piece of copper lying on the bench to the left of the soldering iron has been turned in a lathe to proper shape for use as a renewal piece of the main body of the iron. After the base has been cut off with a hack saw the part will be ready for use.

The arc is formed between the end

of a $\frac{1}{2}$ -in. carbon and the bottom of the cup. Adjustment of the carbon is accomplished by grasping the tape-insulated end of the carbon with the hand and sliding the carbon to the desired position. Current is conducted to the carbon through a leaf spring of brass mounted on a copper disk to which one wire is connected.



Iron and a Partially-Made Body

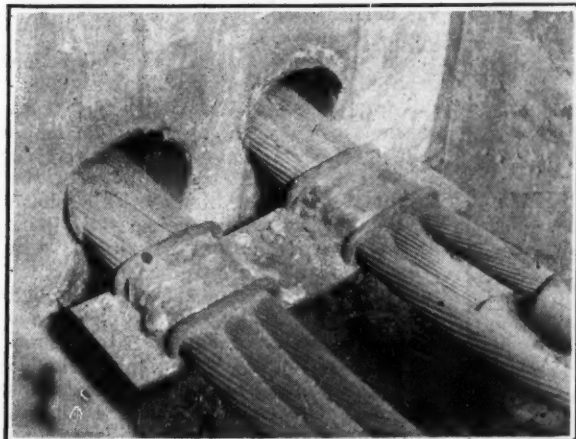
The body or cup, of copper, resembles a goblet with the bottom cut off. The arc, which heats the iron, plays between the end of a $\frac{1}{2}$ -in. carbon and the bottom of the cup.

Below this disk is an asbestos plate which forms the cover of the cup. It has a projecting part which is attached to the handle. The iron illustrated has the following dimensions: Outside diameter of cup 2 $\frac{1}{2}$ in., inside diameter 1 $\frac{1}{2}$ in., depth of hole 2 in.; and soldering point 1 in. diameter by 1 in. long.

PREFER ARC TYPE

Power to operate the iron is taken from the 275-volt direct-current circuit. A resistance, external to the iron, limits the arc current to approximately 20 amp. A. E. Giles, of Benton, Ill., chief electrician of the C. W. & F. mines, said that when he first introduced these arc soldering irons at the company mines the electricians did not like them. After a little experience, however, the men began to express their preference for the arc type.

Mr. Giles was careful not to leave the impression that he originated the iron. He said that he saw the type in use a number of years before its introduction to the C. W. & F. mines.



Negative Lines Paralleled

In the manholes near each generator where the negative connections are made, the six 1,000,000-circ. mil main-return cables are soldered to a tie strap. This insures maximum efficiency from the conductors.



News Of the Industry



British Strike Leaders Blocked In Efforts to Force Settlement; Would Talk Pay, But Not Hours

British strike leaders are discovering that it is much easier to force a suspension of mining than to find an acceptable basis for a resumption of operations. Rebuffed by the mine owners a fortnight ago, last week, "Emperor" A. J. Cook, secretary of the British Miners' Federation, turned to the government for comfort and aid and made a plea for a renewal of the subsidy which fell on deaf ears.

Blocked at Downing Street, the Federation on Aug. 28 issued a public manifesto in which it abandoned part of its platform of "not a minute more or a penny less" and expressed a willingness to discuss wages with the employers if it could save the seven-hour day and the national agreement out of the wreck of its program. In the meantime, the government, taking cognizance of the outbreaks in the mining fields in which workers have accepted terms proposed by the operators, called Parliament in session on Monday of this week to continue the emergency regulations first enacted when the country was faced with the general strike.

The manifesto of last Saturday read:

Union States Position

"The Federation is well aware of the owners' belief that in the long run the miners will be forced to submit to any terms, however inequitable, through the starvation of their families. It is sufficient to point out that the spirit of the miners, so far from being broken, as the owners and the government appear to suppose, is resolute and unshaken, and that, as messages which pour into the Federation's offices show, they will in no circumstances consent to terms which would break up their national organization and deprive them of the seven-hour day.

"At the same time the Miners' Federation is prepared to enter into negotiations on this question of wages and deplores the fact that the owners sabotaged discussion thereon by insisting upon proposals which, after an exhaustive inquiry, were roundly condemned by the Royal Commission. Provided it is satisfied that the reconstruction of the industry on the lines recommended by the Royal Commission would be genuinely taken in hand by both the government and the owners, it is ready at any moment to discuss the question of wages, either with the government or with the owners."

Publication of the report of the proceedings of the Downing Street conference of Aug. 26 between the government ministers and the strike leaders, made it clear that neither side was ready to then concede anything. The miners' spokesmen apparently proposed nothing but a renewal of the subsidy and this was flatly refused by Winston Churchill, Chancellor of the Exchequer.

The Chancellor's position and his previous advocacy of the eight-hour day nettled the miners' representatives. Mr. Cook declared the attitude "brutal" and Herbert Smith, president of the Federation declared the miners were not at Downing Street to beg. "We have been doing our utmost to avoid flooding the pits," he said, "but after your speech we must fight on; you force us to do it."

Union Ousts Farrington From State Presidency

Frank Farrington, president of District No. 12 of the United Mine Workers, was ousted from that position at a special meeting of the executive board of the Illinois union on Aug. 30. This action, taken on the demand of International President John L. Lewis, a bitter political enemy of the Illinois leader, followed charges that Farrington had signed a three-year contract to join the forces of the Peabody Coal Co. as a labor counsel.

According to district union officials meeting in Springfield, Ill., Monday, the deposed president, who is now in Europe on a labor mission, cabled a virtual admission of the charges that he would accept a position with the Peabody company at a reported salary of \$25,000 per year and had planned to resign from his post with the union in October. The district executive board declared the office vacant, but passed a resolution that Farrington could regain his place by disproving the Lewis charges. Mr. Lewis characterized this resolution as "a mere gesture."

Harry Fishwick, vice-president, has been appointed acting-president.

The situation in the coal fields is unchanged. While there is a slow drift back to work by the men in the Midlands, the big coal fields in Wales, Durham and Yorkshire as yet are not affected by this movement. Three hundred safety men have withdrawn from the Bentley colliery, in Doncaster, and the question of withdrawal of the safety men in Wales is being discussed.

Plans have been made at the Home Office to send large special squads of police into the coal fields if more disorder breaks out. Some of these will be drawn from the London district. It was stated that the government would act promptly and vigorously to check any more intimidation on the part of the striking coal miners. It is in constant close touch with the districts where the strike is in progress. Already large squads of extra police have been drafted into the Mansfield area from Manchester and Leeds.

Rocky Mountain Engineers to Meet at Glenwood Springs

In one of the most beautiful spots in Colorado, Glenwood Springs, the Rocky Mountain Coal Mining Institute will hold its summer meeting Sept. 9-11, and will be addressed by I. M. Charles on "Washing Domestic Coal," by S. W. Farnham on "Underground Loading," by S. T. Baker on "Treating Mine Timbers" and George Moorehead on a "new subject," very mysterious and not stated.

Will Not Consider All-Rail Rates As Separate Issue

The petition of the New England interests active in seeking all-rail rates from West Virginia that a decision be made on that question without regard to the investigation now under way into the relationship of tidewater rates from both West Virginia and Pennsylvania has been denied by the Interstate Commerce Commission.

Several weeks ago the Commission granted a petition of the central Pennsylvania producers to broaden the issues in the *Anthracite Rate Investigation* to take in tidewater rates to the Northeast as well as the rates all-rail from the southern producing fields. This phase of the inquiry was considered in part at the hearings held at Atlantic City in June and has been set down for further hearing before Commissioner Campbell at New York on Oct. 6. The New England proponents of a new rate adjustment from West Virginia sought to have the Commission sever the issues and not delay decision on the all-rail rates until it had taken evidence and considered the tidewater rates.

Bradley, Back from Great Britain, Says Miners Have Lost Strike and Many of Them Are Resuming Work

The British strike is on its last legs, in the opinion of J. G. Bradley, president of the Elk River Coal & Lumber Co. and of the West Virginia Coal Association, who returned from a visit to Great Britain last Saturday. Discussing the results of his observations with representatives of the press in a conference at the Hotel Belmont in New York City, Mr. Bradley asserted that the resistance of the mine workers was crumbling.

One man in every ten in Scotland, said Mr. Bradley, was back at work, and miners were returning in all the districts of England. The man on the street in Great Britain was tired of subsidies and the dole. He declared that the strike was closely allied with the spirit of radicalism that had made such strides in Great Britain but had received a considerable set-back as a result of recent events.

The enterprise of the *Daily Mail*, of London, in sending reporters to America to find out why the United States was so prosperous had much to do with the change in British sentiment. The editors of that publication had noted that the United States had enjoyed industrial peace and prosperity and wondered whether there were not some relation between the two conditions. Investigation showed that between labor and capital in the United States there was a greater degree of co-ordination than in Great Britain.

Praises Baldwin Policy

Mr. Bradley emphasized the fact that the attitude of the British administration under Mr. Baldwin had done much to keep the strike free from government interference. British governments in the past had regarded coal strikes as matters for administration action, but all the interference had resulted only in making conditions worse. Leaving industry to settle its own difficulties, as Great Britain had recently done, was already mending the situation that undue meddling had created.

About a third of the mines in Great Britain could be operated at profit, Mr. Bradley stated. One-third could be mined breaking even and one third could work only at a loss. To let this last third cease operation thus providing for the survival of the fittest, he contended, was not a safe policy as these mines when flooded would be a total loss and Great Britain could not afford to have this capital and these resources swept away.

Criticizes Shipping Board

He declared that the United States could get coal on board ship at a cost equal to that of production in Great Britain, but said that ocean freight rates in normal times put the coal of the United States out of the running. The British needed their foreign coal trade to help them run the ships that brought the raw materials on which their industries depended. Mr. Bradley said he regretted that the U. S. Ship-

ping Board had seen fit to raise the rates on coal since the export of American coal had revived. It showed once more the evil effects of government ownership. Private capital would have been less ready to kill the goose that laid the golden eggs. He did not believe that the United States should subsidize its foreign trade in any manner, not even as a ship subsidy. Coal exports should stand on a sound economic basis.

Questioned about the settlement in the United States when the Jacksonville agreement is ended he refused to prophesy, but said that 70 per cent of the present production was non-union and that the coal industry could produce 20 per cent at least more that it is now producing. He could not see, therefore, why the consumer should not be entirely at ease as to the situation and be satisfied to let the operators and miners compose their troubles without government interference.

Union Licked in West Virginia

As for West Virginia, it was burnt ground for the union. The fire of unionism has swept it many times and burned up all the stubble it could find. No operator in the state was afraid that West Virginia would be involved in the national strike should it come. He thought John L. Lewis would note the discomfiture of "Emperor" Cook and be disposed to go cautiously in attempting a national strike, which could at best lead only to another Jacksonville agreement with all wretchedness and misfortune to Mr. Lewis' followers that the previous agreement had caused.

"The emigrants which formerly came

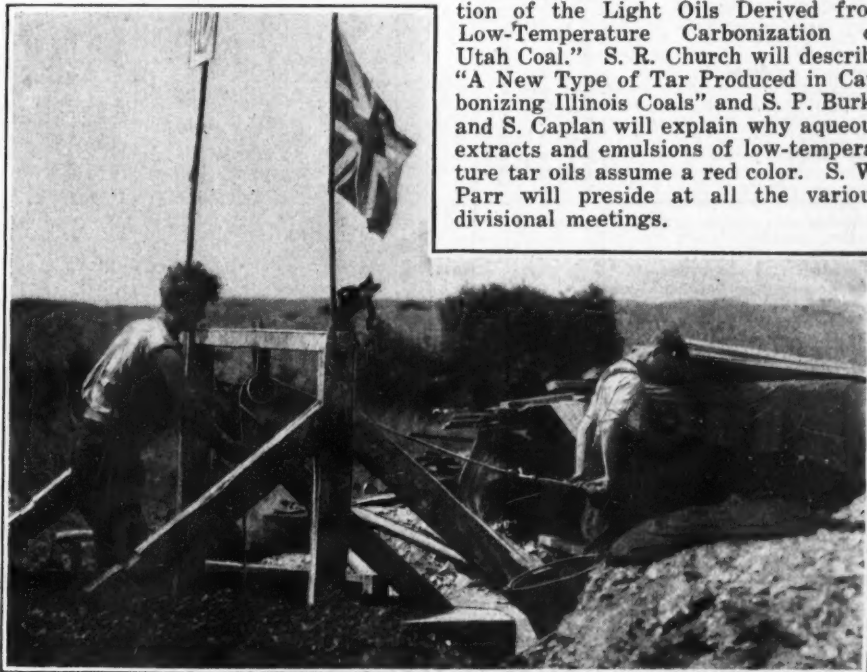
to the United States" said Mr. Bradley "must now find their way to South America, building up the industrial life in those countries. This will stimulate the trade of United States, and the coal trade with those countries will prosper accordingly."

American Chemical Society to Give Coal Attention

Many papers of interest to coal-process men will be presented at the meetings of the Division of Gas and Fuel Chemistry of the American Chemical Society which meets as do the other divisions at the Bellevue-Stratford Hotel, Philadelphia, Pa., Sept. 6-11. On Sept. 7, G. G. Brown and G. B. Watkins, continuing their discussion on gas explosions, will deliver three papers, one on "The Effect of Fuel Constitution on the Rate of Rise of Pressure," one on "The Rate of Rise of Pressure and the Detonation Wave" and a third on "The Probable Cause of Detonation in the Internal-Combustion Engine."

S. C. Lind and D. C. Bardwell will describe the "Effects of 'Anti-Knock' in Slow Oxidation of Methane Under Influence of Ionization." As coal gives, on distillation, a fuel oil, benzol, that is "anti-knock" there is much interest to coal men in the study of this subject. Another valuable paper on Sept. 7 will be one by S. P. Burke and V. F. Parry on the "Heat of Carbonization of Coal."

On the afternoon of Sept. 9 and the morning of Sept. 10, S. W. Parr will lead the symposium on the processing of coal with an article on "Future Trends in Low-Temperature Carbonization." I. F. Laucks will discuss "The Screw as a Carbonizing Machine." C. V. McIntire and L. R. Thompson will speak on "Low-Temperature Semi-Coke in Briquetted Form," D. S. Chamberlin, R. Loebell and R. Binai on "Primary Condensation of Coke-Oven Gas," R. L. Brown and R. B. Cooper on "Composition of the Light Oils Derived from Low-Temperature Carbonization of Utah Coal." S. R. Church will describe "A New Type of Tar Produced in Carbonizing Illinois Coals" and S. P. Burke and S. Caplan will explain why aqueous extracts and emulsions of low-temperature tar oils assume a red color. S. W. Parr will preside at all the various divisional meetings.



Defying a Strike Under the Union Jack

Staffordshire mine workers are not all in sympathy with "Emperor" Cook. Numbers of men have started outcrop workings at Cheadle and are operating their miniature pits under the shadow of the British flag. This group has "Felix" for a mascot.

Forty-four Mine Workers Killed As Result of Explosion at Clymer In Gassy Mine—Inquiries Started

Forty-four mine workers were killed as the result of an explosion in the Sample Run No. 1 mine of the Clearfield Bituminous Coal Corporation at Clymer, Pa., on Aug. 26. There were sixty-eight men in the mine, a slope operation, at the time the accident occurred. Some of those rescued were so badly injured that it was necessary to take them to the Dixonville hospital.

The exact cause of the accident has not been determined. The mine was classified as gaseous and for that reason electric lamps were used exclusively in the mine. As near as could be learned in advance of official inquiries now under way, there were three explosions. The first took place between 1:30 and 2:30 p. m. about a mile from the entrance to the mine. The force of this explosion tore the fan from an air-shaft. Later there were two minor shocks felt by persons in the vicinity of the mine.

Dr. W. E. Dodd, company physician, one of the first men to enter the mine after the explosion, told a news agency representative that the blast caused wide-spread devastation and that the tunnels were so heavy with gas that no human being could survive in them. He said that within the slope, under piles of rock, he saw the bodies of six miners. Some were badly mangled, while others bore no marks, indicating that they were victims of afterdamp.

Volunteer rescuers who entered the gas filled slope in their effort to save the underground toilers, were driven back time and again. Before the deadly gases became heavy in the dark recesses, the rescuers succeeded in

bringing out the four bodies and the two others were located under falls of rock and dirt. Four men, near the mine mouth, were found to be alive.

Believe Gas Caused Blast

Veteran coal diggers, familiar with mine explosions, expressed the belief that the blast was caused by the ignition of gas. A few hours after the explosion the rescuers on hand forced through an underground passageway but it was filled with gases and they could work only a few minutes. It was hoped that by bratticing the rescuers could combat the gases and advance into the furthest reaches of the mine, but the hope was abandoned after herculean efforts.

When word of the blast spread throughout the central Pennsylvania field, mine after mine sent in rescue teams and safety apparatus. An automobile rescue truck was sent from the U. S. Bureau of Mines at Pittsburgh. Rescue teams sped from Johnstown and other mining towns in the region on special trains. Others were sent by the Bethlehem Mines Corporation.

The last of the victims were not recovered from the mine until Saturday, following practical continuous work by the rescue squads digging through heavy falls of rock.

The Sample Run mine ordinarily employs about 210 workers. It had, however, been closed down for several months. The force caught in the disaster were cleaning up preparatory to a resumption of operations at the mine early this fall.

Ohio Operators May Re-Open On Modified 1917 Scale

Operation of Ohio mines which have been idle for months on an open-shop basis and at a wage scale much lower than that provided in the Jacksonville agreement is forecast in the adoption of the report of the scale committee of the Ohio Coal Operators' Association at a protracted meeting of the organization at the Neil House, Columbus, Ohio, Aug. 24. At that time, the members approved the recommendations for a scale which closely approximates the November, 1917, basis. The question of starting up operations, however, is left to the decision of the individual producing companies.

The meeting, attended by operators representing fully 85 per cent of the production of the state, considered the letter of Lee Hall, president of District No. 6 of the United Mine Workers, rejecting the invitation for a joint wage conference and, in a reply, signed by President S. H. Robbins and Secretary John S. Jones of the Ohio Coal Operators' Association, placed responsibility for the present "deplorable" situation in the Buckeye mining districts squarely upon the shoulders of the union.

Although the scale committee had been in session at Cleveland on Aug. 17 and 18, its report was not completed until after the association meeting proper was under way. While the delegates were discussing the general situation, members of the scale committee wrestled with questions of rates to machine men, for machine men, loaders, day rates and the disposition of fractional amounts in hourly pay. The latter were discarded, the sum in every case being increased to the next full cent. Days rates were fixed at \$4.75 and \$5.

In their reply to Mr. Hall, the operator said:

We have your letter of Aug. 16, replying to ours of the 10th, asking that you call a joint meeting of the Ohio miners and operators for the purpose of considering a scale of wages upon which idle mines of Ohio might be re-opened.

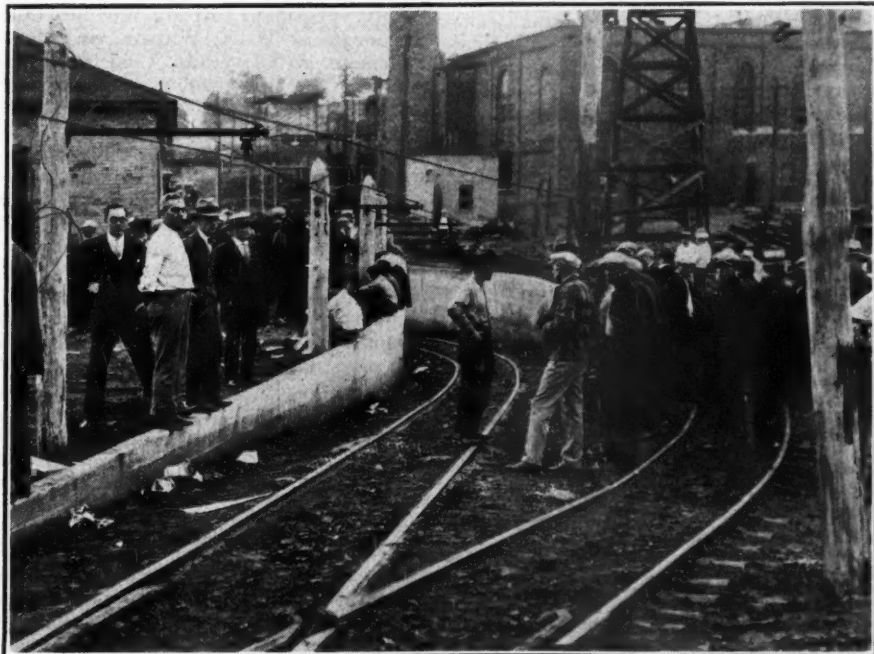
We note that upon your own responsibility you refuse to call such a meeting.

We are thoroughly familiar with the Jacksonville agreement and carefully considered the provisions you cite before we wrote you. There is, however, ample precedent for our request that this contract be modified. You will recall that the contract of 1917 was twice modified at the request of the miners, and that the contract was again modified in 1920 at their request. Each modification resulted in a substantial advance in wages. The so-called Jacksonville agreement may be modified by mutual consent in the same manner.

This contract more than any one thing is responsible for the deplorable situation existing to-day in Ohio's coal industry. Mines in other districts, with which Ohio competes are producing coal on lesser wage scales and have captured the markets which rightfully belong to Ohio. Strangled by the high cost fastened on us by the Jacksonville agreement, we have been powerless to prevent this and many of our mines have consequently closed, with the result that to-day more than two-thirds of the miners of the state are idle and their families are in a condition of absolute want.

These conditions will continue until wages are adjusted and it was with the hope of preventing further destruction of our business, serious injury to the mining districts and further suffering on the part of the miners that we sought this conference with you and your membership.

Your refusal to meet with us puts the responsibility for the present situation and its continuance squarely on your own shoulders—a responsibility we do not care to share.



(Acme Photo)

Preparing to Enter the Scene of the Disaster

The explosion took place at the first left heading, about a mile from the entrance to the mine. It was not known that an explosion had occurred until workers on the surface noticed dense clouds of smoke pouring out of an air-shaft.

Ruhr District Will Hold Ground Won During British Coal Strike, Says Jungst, German Economist

By Paul Wooton

Washington Correspondent of Coal Age

Coal operators in the Ruhr have profited permanently by the British strike, in the opinion of Dr. Ernst W. Jungst, of Essen, the economical secretary of the Bergbau-Verein, who is in the United States familiarizing himself further with mining conditions in this country.

Since the trouble began in the British mines the Germans have annexed most of the British markets on the Continent. The immediate future has been protected by the insistence of the Germans on long-time contracts. Before these contracts expire the German operators will be in a position to meet British prices in most of the markets involved.

Mechanization of mines in the Ruhr is proceeding rapidly, Dr. Jungst points out. The output per man per shift has passed the one metric ton mark, and now is essentially higher than it is in the United Kingdom. More efficient methods are being applied as rapidly as possible with the result that Ruhr coal probably is going to be a much more familiar article in world markets than it has been in the past, Dr. Jungst believes.

Against Wage Cuts

Wage cuts will be the last resort in the effort to compete with British coal, Dr. Jungst declares. "Our endeavors will be concentrated on increasing the output per man," he says. "In this we have been favored with the cooperation of our labor. For instance, a schedule has been worked out for lowering the men into the mine. Each group of men working together know they must be at the mouth of the shaft at a certain time. In this way the loss of time occasioned to all members of the group by the tardiness of one of the number is avoided. This simple expedient has increased the working time at the face nearly thirty minutes."

Without reopening the less efficient mines the Ruhr may be able to produce coal at the rate of 150,000,000 tons a year, Dr. Jungst explains, but the output in 1925 was only slightly in excess of 100,000,000 tons, less than the pre-war average. This is due in part to the loss of market to brown coal and water power. In 1925 Germany pro-

duced 140,000,000 tons of brown coal, an increase of 60 per cent over 1913.

All the indications, however, seem to point to a steady growth in Ruhr production. The operators there expect to do an increased export business. Inefficient operation of the mines in the Saar basin and in upper Silesia is working to the advantage of Ruhr mines. As reconstruction progresses German industry will have to call upon the Ruhr for increasing quantities of coal.

Would Avoid Competition

The German operators are no more anxious than are the British owners to enter upon a period of cut-throat competition. When the British proposed an agreement for the partition of markets, the Germans gave every assurance that they would be willing to enter upon negotiations to that end. As the discussions progressed it became increasingly apparent that there was no organization in the United Kingdom which could control the exports. While hope has not been abandoned that some such plan may be worked out, it seems to the Germans that the British will have to overcome some difficult obstacles before they can enter upon such an arrangement. The Germans feel that this is a sensible way to meet the situation at a time when a great need exists in each country for an active, prosperous coal industry.

The coal industry in the Ruhr supports three major organizations. One association, the Zechenverband deals with labor relations only. Another, the Bergbau-Verein, performs much the same functions as the National Coal Association. While membership is voluntary, it represents 100 per cent of production. The third organization is the sales syndicate. The operators are assessed one mark for each 100 tons of production to maintain the first two of these organization activities. The Bergbau-Verein was organized in 1858; the syndicate in 1893, and the labor organization in 1908.

Railway Fuel Costs Decrease

Averages compiled by the National Coal Association from monthly reports submitted by Class 1 railroads to the Interstate Commerce Commission, showing the quantity and cost of coal per net ton, including freight, used for fuel in train locomotives by Class 1 railroads during June, 1926, are as follows: Eastern District, \$2.62; Southern District, \$2.15; Western District, \$2.96; United States, \$2.61. These averages show but little variation from the totals reported for many months past. The difference in the average for the United States as a whole from June, 1925, is \$0.09 per net ton decrease.

War Veterans' Leader Wielded Miner's Pick

From coal miner to the president's chair of three mining companies is the record of Commander-in-Chief Fred Stover of the Veterans of Foreign Wars of the United States, who hold their annual national encampment September 19-23 at El Paso, Texas.

On May 18, 1898 Mr. Stover was wielding a pick in a coal mine near Butler, Pa., but he abruptly ended his labors as a miner and enlisted for service against the Spanish forces. He served with Company C of the 23rd Infantry in the Philippines until peace was declared.

When the war ended, Mr. Stover resumed his work as a miner at Butler. In a short time he was made superintendent, and then became a mine operator for himself. He now is president of the Coal Operators Sales Co., Cosco Gas Coal Co., and Butler Coal Mining Co.; secretary of the Victoria and Spring Valley Coal Companies; treasurer of the Argentine Coal Co., Zenith Coal Co., and Northwestern Coal Operators Association.

New Association Incorporated In Northern West Virginia

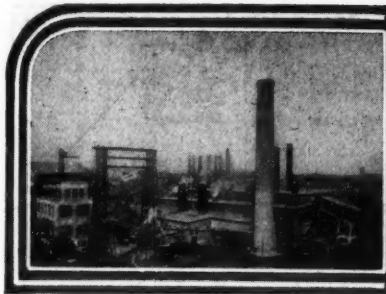
After a period of about two years during which there was no association of operators in the Monongalia field owing to differences as to the proper labor policy to pursue, the Monongalia County Coal Operators' Association has been incorporated by Charles A. Goodwin, general counsel for the Brady-Warner Collieries Co.; F. C. Shriver, president, Shriver Coal Co.; Samuel D. Brady, president, Brady-Warner Coal Corporation; W. E. Watson, president, Fairmont & Cleveland Coal Co., and Emmett M. Showalter, general counsel, Continental Coal Co.

John H. Jones, president of the Bertha-Consumers Fuel Company, Pittsburgh, Pa., has been elected president; R. M. Davis, Gilbert Davis Co., Morgantown, vice-president; F. C. Shriver, Morgantown, treasurer.

Impetus was given to the organization of the new association, it is stated, when the proposed merger of the coal companies in northern West Virginia fell through. The association is intended to promote the welfare of the coal mining industry in the Monongalia County region, insure the safety and welfare of the men employed in the mines, keep a watchful eye on freight rates, "develop and establish an up-to-date accounting and cost-keeping system and a statistical bureau to ascertain, compile and distribute facts, data and statistics affecting coal production and to bring about uniform standards of classification of grades and sizes of coal marketed from the mines operated in this field."

Class I railroads in July installed 6,170 coal cars in service.

EDITOR'S NOTE—The foregoing Washington letter reflects certain views of official Washington. Due to the fact that policy as a rule prevents government officials from permitting their views being quoted directly, the authority for these reports is necessarily somewhat vaguely referred to. The views reflected are not those of any one group of officials, but of different men, in the legislative and executive departments. There is no necessary connection between their views and COAL AGE editorial policy; neither do they necessarily represent Mr. Wooton's personal views. It is felt that the opinions thus faithfully reflected will be of great interest to the industry. Where opinions are cited from sources outside of the government, the source will be specifically stated.



News Items From Field and Trade



ALABAMA

The DeBardeleben Coal Corporation has constructed a large dam for impounding water for use of its washery at Hull Mine, Walker County, as a precaution against shortage in case of drought. A new jig has also been added to increase washing capacity at this Big Seam operation. Production capacity of Corona No. 14 has been doubled and mine No. 15, recently developed, is now producing 500 tons daily.

COLORADO

July Output Increases.—The monthly report of James Dalrymple, state coal mine inspector, shows a July production of 668,865 tons—the first increase over 1925 figures reported this year. The total output for the first seven months was 5,315,678 tons, an increase of 5,365 tons over last year.

ILLINOIS

Peabody Takes Title.—The Peabody Coal Co. has taken title to eight mines and several thousand acres of coal land in Christian and Sangamon Counties formerly owned by the Springfield District Coal Mining Co., according to a deed filed in Taylorsville Aug. 21. The properties, which have been under lease to the Peabody interests for several years, include mines Nos. 51, 52, 53, 54, 55, 56 and 57 in Sangamon and mine No. 58 in Christian County.

Production Gaining.—A total of 4,268,197 tons of coal was mined in Illinois during July, A. D. Lewis, director of the Department of Mines, reported. This was an increase of about 220,000 tons over the previous month and slightly above the same period a year ago. The report showed there were 152 mines operating in the state employing 47,761 men, as compared to 147 mines operating in June employing 45,161 men.

Urges Early Buying.—The consumers Co., Chicago, last week issued a series of articles advising early coal buying by the public as a protection against higher prices. Eight stories were distributed as data and instructions to the sales force on basic reasons for price advances, the "bootleg" coal dealer, quality, "buy coal now," coal or coke absolutely safe, "think of next winter now," and coal insurance.

Calls Flood New Bureau.—The new Chicago Fuel Service and Research Institute is being swamped with requests for inspections of heating appliances in Chicago and Cook county. The small staff of workers is proving somewhat inadequate and plans are under

way for increasing the inspectors. To meet this contingency, it is proposed to provide: A reasonably comprehensive but short course on practical combustion that will be offered to interested students in the various technical colleges and high schools of the state, with the expectation that men so trained may be able to earn money each summer with which to continue their further work in such school or college.

New Coke Plant Planned.—A \$10,000,000 high temperature coke plant with an initial battery of 21 ovens is planned for Waukegan, Ill., near Chicago, by William A. Baehr, general manager of the North Shore Gas Co. and recently vice-president of the Illinois Power & Light Co. Negotiations have practically been completed for a site from the Elgin, Joliet & Eastern R.R. A lake front right is desired and fifty acres of land will be purchased. Ultimately, according to Mr. Baehr, the plant will have 168 ovens.

A. D. Lewis, Illinois director of mines and minerals has issued a permit for the reopening of the Reichert mine, north of Freeburg. The mine was sealed July 14, following a fire.

INDIANA

Fire Hits Kern Mine.—Fire starting in the boiler room at the mine of the Kern coal Co., three miles east of Terre Haute, burned the engine room, tippie and other buildings at the plant with a loss of approximately \$15,000. The flames also spread into the interior of the shaft of the mine and considerable damage followed from this source. The origin of the blaze is not known. It is believed that most of the machinery in the engine and boiler rooms can be salvaged with little loss.

Commissions Disagree.—Rejection of the petition of the Owensboro, Rockport & Chicago Ry. by the Interstate Commerce Commission for authority to build a line from Owensboro, Ky., to Elnora, Ind., came as a surprise to the members of the Indiana Public Service Commission, who had favored such action. The new road would have opened a new coal field in southern Indiana and would have served Rockport, Tennyson, Folsomville, Stendal, Pikeville, Velpen, Ireland, Montgomery, Elnora Junction and Elnora.

Knox County Outlook Bright.—Conditions in the mining industry in Knox County, are brighter than for several years. American No. 1 has re-opened and American No. 2 is working with a full crew. Panhandle and Standard mines are hoisting regularly. Construction work at the Westphalia Fourth Vein mine was rushed to completion and that mine has just started back to

work. Early this month the Indian Creek will resume operations.

Retail Prices Advanced.—An advance of 25c. to \$1 a ton in retail coal prices has been placed in effect in Indianapolis. The higher retail prices followed a series of advances announced by Eastern coal operators. It is freely predicted that retail prices will advance further before the advent of cold weather.

Forecasts Improvement.—A revival of the mining industry in Indiana, Illinois and Kentucky is seen by Edward Buick, official of the American Car & Foundry Company, Terre Haute. "Conditions are much improved," Mr. Buick said. "We are filling orders for mine cars from Indiana, Kentucky and Illinois. Orders from the last state indicate that the industry there is getting back on its feet at a rapid rate."

MISSOURI

To Re-open West Mine.—The unemployment problem created in the Lexington district early last month when 170 miners working in the South mine of the Western Coal & Mining Co. were made idle by the leasing of that property to the state for convict operation will be taken care of by the reopening of the West mine of the leasor this month.

MONTANA

Uncover New Coal Deposits?—Sam Bates and Lawrence Peterson, of Lima, are reported to have uncovered a forty-foot ledge of high-grade soft coal in the Medicine Lodge district of Beaverhead county.

NEW YORK

Will Sell Reading Rights.—The Baltimore & Ohio R.R. is reported to be negotiating for the sale of its rights to subscribe to the stock of the Philadelphia & Reading Coal & Iron Corporation. B. & O. ownership in the Reading companies entitles it to subscribe to 606,652 shares of the coal company stock. The present market value of these rights approximates \$11,715,000.

Pennsylvania Deficit Decreases.—A deficit of \$42,838, after ordinary taxes, depreciation and depletion, before federal taxes, is shown for July by the Pennsylvania Coal & Coke Company, as compared with a loss of \$55,948 in July, 1925. For the first seven months of this year the company reports a deficit of \$237,976, as against one of \$405,041 in seven months last year.

Who Will Get Coxe Bros?—Lehigh Valley R.R. stockholders are awaiting with interest disposition of the second large anthracite producing subsidiary, ordered several years ago as soon as

found expedient after February 1, 1926. It is generally understood the property will be sold to a larger company or a banking group. There seems to be little likelihood that rights to subscribe to Coxe Bros. stock will be offered stockholders of the railroad, as in the Lehigh Valley Coal Co. segregation.

Ogdensburg has a new coal company, formed by George J. Madden, Harry M. Atwood and James J. Meehan, for a long time connected with the George Hall Coal Co., which is to be called the Madden Coal Co. New machinery is being put into a local yard that the company has bought.

At the meeting of the New York State Federation of Labor in Niagara Falls on Aug. 24th, Ben Tillet of the British Trades Union Congress made a plea for the striking British coal miners and raised \$1.40 for them.

PENNSYLVANIA

Fatalities Increase.—Eighty-eight of the 196 fatalities reported to the State Bureau of Workmen's Compensation in July occurred in coal mines. There were 64 fatalities in the anthracite region and 24 in the bituminous districts. The July total fatalities were the largest for any month this year. During the month the Board awarded \$949,519 compensation, bringing the total awards since the law went into effect in 1916 to \$115,945,945.

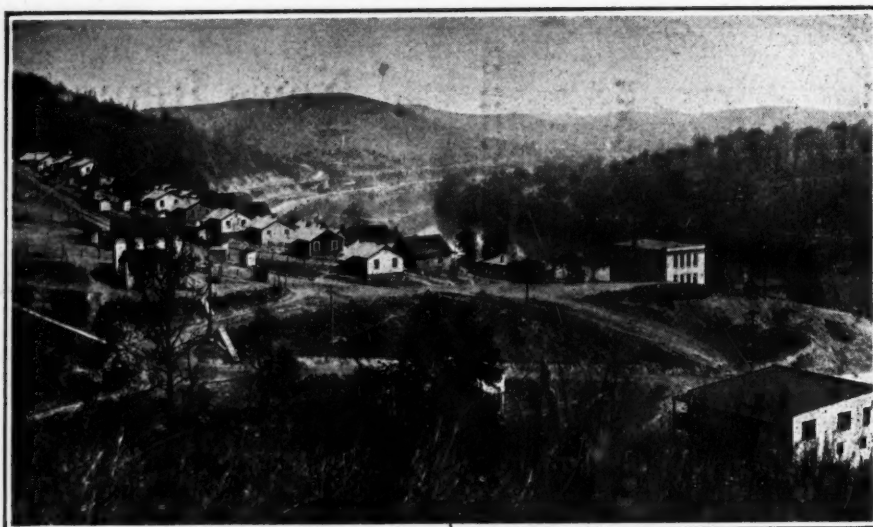
Railroad Administration Sues.—A suit asking \$7,179.49 from the Johnstown Coal & Coke Co. for war tax and demurrage alleged to be due the U. S. Railroad Administration was filed in the United States District Court in Pittsburgh on Aug. 24. The suit is an outgrowth of the operation of the Tidewater Coal Exchange, formed during the World War for the purpose of facilitating the shipping of coal to the eastern market.

There is a steady increase in the demand for miners in the Johnstown district of central Pennsylvania. The state employment office in Johnstown is daily receiving inquiries for miners in the territory embraced in the district.

Fight Indiana Mine Fire.—A serious fire broke out in the Sagamore mine of the Buffalo & Susquehanna Coal Co. in Indiana and mining men and rescue workers are putting up a hard fight against the spread of the fire. It is reported from the mine that the fire is minor but that the smoke is of such volume as to prevent carrying out methods employed in extinguishing such fires. The rescue squad of the Johnstown division of the Bethlehem Mines corporation is assisting in sealing off the chambers where the fire is located.

Work is progressing slowly at Franklin's new battery of Koppers coke ovens as a part of the Cambria plant construction program of the Bethlehem steel mills at Johnstown. Between 75 and 100 ovens are being placed. When completed, each oven will have a capacity three times as great as the ovens that are being replaced.

To Reopen Dorothy Mine.—The Big Dorothy mine of the Youghiogheny & Ohio Coal Company at Glen Robbins,



Dakota Plant of the Bethlehem Mines Corporation

This and the mine at Barrackville, W. Va., which is nearby, make up the Marion division of the company. The two mines were reopened on a non-union basis in the autumn of 1924, and have been producing at a high rate ever since. The headframe and tippie are at the extreme right of the picture.

near Martins Ferry, Ohio, will resume operations shortly, probably this week, after being idle for twenty-one months. The mine is to work under the Jacksonville scale.

Back to 1917 Scale.—The Kramer mine of the Northwestern Mining & Exchange Co. has been re-opened on the 1917 wage scale. The mine can use 500 to 600 men. Seventeen men went to work the first day, but on the second day there were 44. A few days later there were 125 and the number is being added to continuously. The union has picketed the mine. It was reported that the company may start other mines on the same basis. It is also reported that No. 2 shaft of the Buffalo & Susquehanna Coal Company might be resumed. The men there quit work in September, 1925, when the company started operations at Sagamore, on the lower wage scale. Judge Frank Graff, of Armstrong County, has made the preliminary injunction granted against the United Mine Workers, restraining picketing, assembly, etc., at the Sagamore mine permanent.

Steel Company Stocking Coal.—The Jones & Laughlin Steel Corporation has started to stock coal on a reservation on Neville Island, near Pittsburgh. The coal is being brought down the Monongahela River from the company's own mines. It is said more than 350,000 tons will be stored before winter.

TENNESSEE

To Stage First Aid Contest.—A first aid contest in which about twenty teams from Tennessee and eastern Kentucky will compete, will be the feature of Miners' Day (Sept. 25) at the East Tennessee Division Fair. A coal-dust explosion and the use of rock dust to stop a mine explosion will be demonstrated by a U. S. Bureau of Mines explosive engineer from the Pittsburgh station. R. E. Howe, secretary, Southern Appalachian Coal Operators Association, will have general charge of the

arrangements which assures its success. F. E. Cash, district engineer, and Dr. A. F. Merwether, U. S. Bureau of Mines of Birmingham, Ala. will assist in the contest. O. P. Pile, chief mine inspector of Tennessee, and Dan Field, George Thom, and Andy Holden, district inspectors, are co-operating. J. M. Webb, U. S. Bureau of Mines, Knoxville, will train the teams.

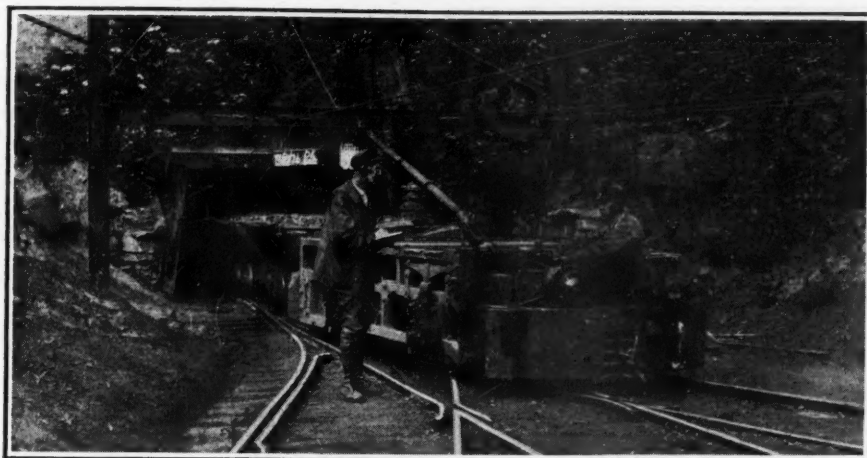
UTAH

Survey Market for Utah Coal.—The Salt Lake City Chamber of Commerce-Commercial Club is conducting a survey to learn to what extent Utah coal mines may hope to compete with those operating in the Middle West. Just how far Utah's coal can be shipped eastward to compete with the Missouri River coal-producing districts is the principal object of the survey, which takes in all Eastern markets and distributing points. The inquiry is expected to produce some valuable data.

State Fuel Bids Submitted.—Bids for the State's fall and winter supply of coal have been made as follows: 2,000 tons slack, delivered in the bins at the University of Utah, Salt Lake City, \$3.37 per ton, Standard Fuel Co.; 1,000 tons of slack delivered in the bins of the State Capitol, \$3.39, Peerless Coal Co.; 1,500 tons screened slack, for State Industrial School, at Ogden, \$1.70, f.o.b. mines, Royal Coal Co.; 600 tons of lump coal for various state institutions, \$2.50, f.o.b. mines, Lion Coal Co. The Peerless-Lion companies both submitted bids of \$1 mines for 3,500 tons of slack, f.o.b. mines, for distribution to various state institutions.

VIRGINIA

First Coal in Three Years.—Coal was shipped from the Cranes Nest operation of the Clinchfield Coal Corporation, near Toms Creek Aug. 24 for the first time in three years. Beginning early in the month, a large force of men was at work reconditioning the mine, and officials of the company hope to get pro-



"How Many Cars Have You?"

This is the main drift opening of the Crane Creek mine of the American Coal Co. of Allegany County, McComas, W. Va. J. H. Hughes, general mine foreman is standing beside the 15-ton main-line locomotive. This mine, which is in the Pocahontas No. 3 bed, produces about 2,400 tons per day. The tippie is equipped with air-cleaning table for sizes 3 in. and under.

duction up to 500 tons per day within a short while.

WEST VIRGINIA

J. E. Stearns of Chicago, president, Westchester Collieries Co., was in Charleston last week for the purpose of making a survey of the 1,025 acres of Pocahontas coal land, which the company purchased recently from The Wise Pocahontas Coal Co., of Hensley, McDowell county, and the Welch Pocahontas Co. of Welch.

Must Flood Mine.—Although progress has been made in extinguishing the fire which started in the mine of the Corona Coal Co. at Hepzibah, about a month ago, District Mine Inspector Evan L. Griffith states that it will be necessary to completely fill the mine with water before there is any certainty that the fire is entirely put out. At the present time there are six feet of water at a point about 300 ft. from the pit mouth. Operations were resumed at the No. 1 mine which is directly across the highway from the burning mine on Aug. 23.

Buys in Mine Property.—On Aug. 18 the property of the Wright Coal Co. at Wright, Raleigh County, was sold at auction under a distress warrant and on an execution. The Erskine Company became the purchaser, the execution being in favor of that company. Purchasers are understood to be planning the re-opening of the mining plant on a larger scale and contemplate the erection of additional houses between Wright and Terry.

Union Denied Injunction.—The United Mine Workers was denied an injunction at Phillipi, W. Va., to restrain the Simpson Collieries & Coal Co. of Galloway, W. Va. from interfering with demonstrations by members of the union. The coal company several weeks ago obtained an injunction restraining picketing activities by the union.

The Elkhorn Coal & Coke Co., of Coopers, surrendered its charter to the secretary of state on August 18, and the corporation has been dissolved, according to a certificate filed.

Coal Company Involuntary Bankrupt.

—The Connellsville Hy-Grade Coal Co., of McWhorter has been adjudicated an involuntary bankrupt by Judge William E. Baker in the United States District Court at Elkins. The case has been referred to Judge Ray L. Strother of Clarksburg as referee, but no date has been set for the first meeting of the creditors to elect a trustee. Judge Baker's action was based on a petition filed by the Union Explosives Co., the West Virginia Mine Supply Co., and A. C. Osborn, trading as J. F. Osborn Sons, all of Clarksburg, alleging that the coal company owes more than \$1,000 and that it is indebted to them.

More Miners Wanted.—Demand for coal in northern West Virginia is growing at such a pace that many companies are advertising for additional men with which to man the mines on night shifts. While under normal conditions mine workers would be sufficient to operate the mines on a full time day-turn basis, some companies for the first time in several years feel under the necessity of utilizing night shifts in order to be in a position to take care of orders promptly.

Coal mines along the Norfolk & Western Ry. in July produced 3,983,240 net tons of coal. The coal loading in

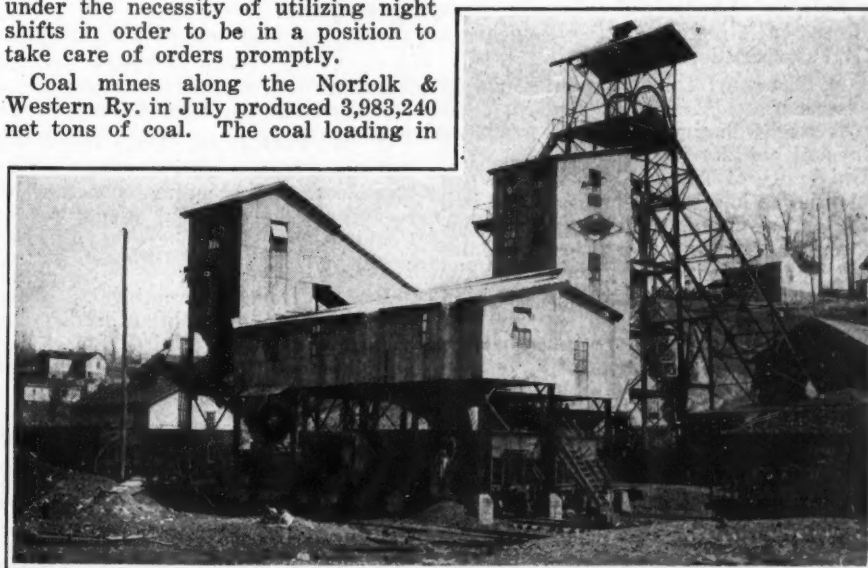
the various West Virginia fields tapped by that carrier was as follows: Pocahontas, 38,225.6 cars; Tug River, 14,291.8 cars; Clinch Valley, 4,081.9 cars; Thacker, 16,394.1 cars; Kenova, 6,671.4 cars.

C. & O. Lays Permit Embargoes.—As a means of controlling the shipment of bituminous coal to tidewater, the Chesapeake & Ohio Ry. has put a new arrangement of embargoes into effect in southern West Virginia. Mines east of the Handley (W. Va.) yards ship on Tuesday, Thursday and Saturday, while the operations west of the yards move coal on Monday, Wednesday and Friday. Due to the jam of coal shipments to Hampton Roads there was a general embargo in effect intermittently on this system.

CANADA

Coke Production Up.—July production of coke in Canada totalled 157,960 tons as compared with 151,564 tons in June, and 89,221 tons in July of last year. Coke plants in eastern Canada had an output of 48,284 tons as compared with 46,785 tons in June. Imports of coke into Canada during July amounted to 79,214 tons as compared with 89,632 tons in June, and exports totalled 3,880 as against 5,250 tons in the previous month.

Meighen Discusses Subsidy.—Right Hon. Arthur Meighen, Premier of Canada, in a campaign address to the miners of Michel, B. C., on Aug. 22, outlined his policy as regards subsidizing the coal mining industry. "We want," he said, "to extend the area of consumption of our coal, by subsidizing transportation. We want the cheapest possible railway rate that will enable the roads to get along. But when we have got that we shall certainly have to do something to pay a portion of that rate from the general funds of the country. If we carry conservative policies into effect our country will certainly be able to pay it."



Modern Tippie at West Virginia Operation

An all-steel structure at Lochgelly, owned by the White Oak Coal Co. This is one of the operating companies controlled by the New River Co., which has fifteen mines, producing approximately 2,500,000 tons annually. The Lochgelly mine operates in the Sewell seam, which at this point is 46 to 54 in. thick.

Among the Coal Men

John H. Tonkin, general manager of the Independent Coal Co., Salt Lake City, has been appointed a member of the Utah Art Institute by Governor George H. Dern. Mr. Tonkin is said to have one of the finest art collections in the state.

D. W. Buchanan, president of the Old Ben Coal Corporation, Chicago, is reported to have announced his intention to take part in the great buffalo hunt on Antelope Island, Great Salt Lake, near Salt Lake City, in November next, when about two hundred of the three hundred and fifty buffalo on the island will be slain. Most of the animals in the herd are said to be very wild and real big game hunting will be available at that time.

William T. Reid, of Denbo, Washington County, Pa., resigned as general superintendent of the Mudge Coal and Coke operations in western Pennsylvania, including the Reliance Coke & Furnace Co. and the Redstone Coal & Coke Co., a subsidiary of the Weirton Steel Co., to become general superintendent of the large coal operation, the Vesta Coal Co., a subsidiary of the Jones & Laughlin Steel Corporation, is putting in in Greene County. The place vacated by Mr. Reid will not be filled at this time.

V. H. Palmer has been appointed acting manager of the Pittsburgh Coal Co. of Ohio, with offices in the Rockefeller Building, Cleveland.

Col. James Elwood Jones, of Switchback, W. Va., vice-president of the Pocahontas Fuel Co., has been renominated on the Republican ticket for commissioner of the County Court of McDowell County and, as nomination is equivalent to election, Colonel Jones will serve another term.

Fairfax Landstreet recently was elected a director of the Clinchfield Coal Corporation.

M. Okada, of Tokyo, Japan, is now in eastern Canada and will remain about two weeks longer. He is a graduate in civil engineering from the Imperial University at Tokyo. For the past five months he has been touring the United States and Canada studying conditions governing the transportation and mining of coal and colliery yards. While in eastern Canada he has been devoting most of his attention to the methods utilized by the operators in transporting coal from the mines, and the general operation of railways by the coal-mining companies at the mines.

Van A. Bittner, international representative of the United Mine Workers in northern West Virginia, who had been in ill health, is reported to be much improved.

H. R. Sullivan, treasurer of the Central Coal Mining Co., Cleveland, Ohio, has been appointed a member of the Tax and Cost Accounting Committee of the National Coal Association to complete the membership of the committee.



J. T. Dunigan

President of the Coal River Collieries Co., which is owned and controlled by members of the Brotherhood of Locomotive Engineers. He was re-elected at the recent adjourned meeting of directors at Huntington, W. Va.

D. B. Reger, of Morgantown, W. Va., assistant state geologist, is preparing to make a geological survey of the smokeless coals east of Rich Mountain in Randolph County.

Major E. L. Daley, federal engineer of the Pittsburgh district, who was promoted and assigned to a post at Fort Humphries, Va., recently was a guest at a farewell luncheon given by the Pittsburgh Coal Exchange at the Duquesne Club in that city. A. W. Dann, president of the exchange, in behalf of the members, presented a traveling bag to Major Daley.

George S. Rice, chief mining engineer of the U. S. Bureau of Mines, just has completed the manuscript of his "Handbook on Safety in Coal Mining."

R. M. Foster, for many years the Norfolk representative for several large coal and shipping concerns, has recently taken the local agency for the Coaldale Fuel Corporation, of New York.

Ersikine Ramsey, prominent Alabama coal operator and philanthropist, has been nominated for United States Senator to succeed Oscar W. Underwood on the Republican ticket.

Obituary

Edward J. Fahey, 41 years old, president of the Grafton Coal & Coke Co., passed away at his home in Grafton, W. Va., Aug. 22. Mr. Fahey had been engaged in the coal business for a number of years and was regarded as one of the best informed mining men in the northern West Virginia field.

Association Activities

A West Virginia membership conference of the National Coal Association held at Huntington Aug. 20 was attended by M. L. Gould, president, Linton Coal Co., Indianapolis, chairman of the membership committee; W. M. Wiley, vice-president and general manager, Boone County Coal Corporation, Sharples, who is the West Virginia representative on the committee; C. C. Dickinson, president, Dry Branch Coal Co., Charleston; W. H. Cunningham, president Burgess Branch Coal Co., Huntington; and Thomas DeVenny, superintendent, Portsmouth By-Product Coke Co., Edgerton, W. Va., directors of the National, and Executive Secretary Gandy and his assistant, Mr. Pape. The entire day was spent in carefully going over the National's membership situation in West Virginia and laying plans to strengthen it. When Mr. Gould left that evening for his home he expressed himself as highly pleased with the conference and stated his opinion that the result of such state membership conferences will during the year prove highly beneficial to the National and in turn to the industry at large. Col. Wiley also stated his conclusion that the day had been very well spent and expressed himself enthusiastically on pressing forward efforts on behalf of the National.

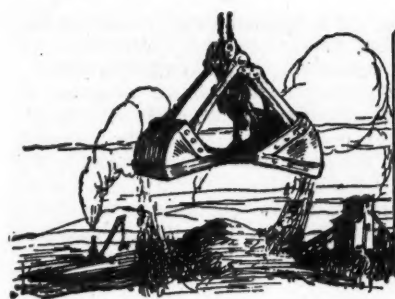
Industrial Notes

F. A. Manley and **F. L. Clemens** have become associated as consulting engineers, with offices at 2217 Tribune Tower, Chicago. Mr. Manley has had more than thirty years' experience in coal-mine engineering and operating. Mr. Clemens, since leaving Washington four years ago, has made a specialty of valuations of properties and analyses of income-tax problems.

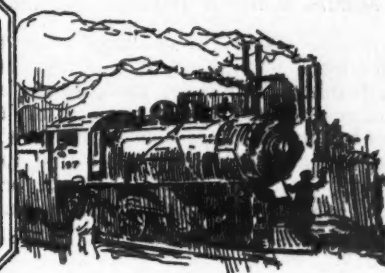
The Keystone Lubricating Co., with headquarters in Philadelphia, widely-known manufacturer of lubricating oils and greases which are used extensively in mining and industrial centers, has established a branch office and warehouse in Birmingham at 2329 First Ave., with Richard G. Barlow, in charge. The states of Alabama, Georgia and Florida will be supplied from this point.

L. J. Belnap has just been elected president of the Worthington Pump & Machinery Corp. following a meeting of the board of directors. C. Philip Coleman, retiring president, was elected chairman of the board. Mr. Belnap was formerly president of Rolls Royce of America and chairman of Wills St. Claire Co., of Detroit.

The Fort Pitt Mine Equipment Co., Pittsburgh, Pa., has succeeded the G. M. Johnson Co., Jeannette, Pa. There has been a complete reorganization with an entirely new personnel, manufacturing and sales policies. The newly elected officers are: Frank J. Lanahan, president; E. W. Wright, vice-president; P. J. Meehan, secretary-treasurer; M. E. Nolan, general sales manager, Louis E. Endsley, consulting engineer.



Production And the Market



Overseas Export Movement Still Dominant Factor In Bituminous Markets; Prices Rising

Without the overseas export movement to give a touch of freshness to the situation, the bituminous coal markets of the country would present a routine and rather uninteresting aspect. Most of the current developments which lift the trade out of the rut may be traced back to the foreign buying which has come to this country as the result of the prolonged British suspension. For the time being, the lake movement, always an important market factor at this season of the year, is relegated to secondary rank.

Naturally, the United Kingdom, which normally is not a factor in American coal export trade, is the largest overseas customer at the present time. But other lands also figure in the current statistics. During the week ended last Thursday vessels cleared from North Atlantic ports with coal cargoes for Argentina, Brazil, Bermuda, the British West Indies, Canary Islands, Cape Verde Isles, Cuba, Dominican Republic, Egypt, French West Indies, Italy, Jamaica, Norway, Turkey, Uruguay and Venezuela, as well as for Great Britain and Ireland.

West Virginia Captures Trade

Most of the increased tonnage called for by this overseas export trade has come from the coal fields of southern West Virginia. Some of the overflow, particularly in bunker coal, has been captured by the central Pennsylvania districts, and Philadelphia again has taken its place as a port of exportation. Western Pennsylvania gas coals also have entered into the picture, but neither the tonnage nor the price reactions in that section of the country has been large.

The flurry in high-volatile prices when the export movement first started has been paled into insignificance by the steady rise in quotations on West Virginia low-volatiles. The weighted average price on smokeless

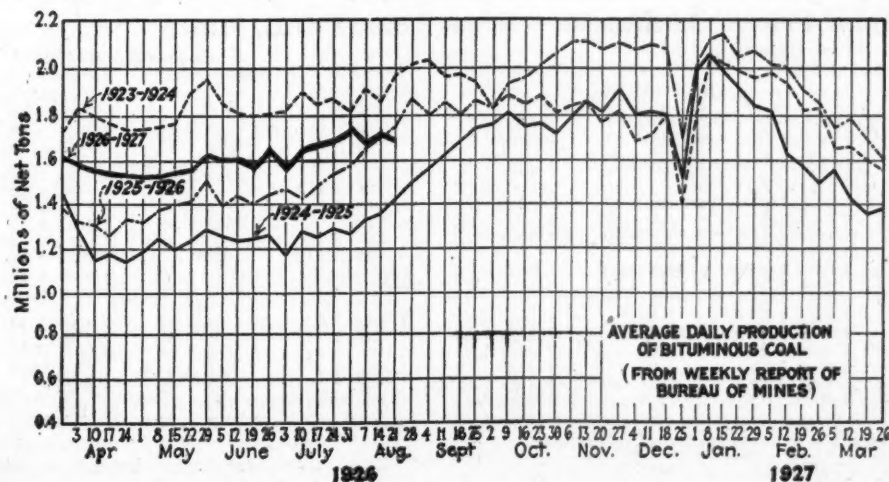
mine-run has marched from \$1.93 to \$2.40 per net ton in the past two months. These increases, recovery in the West Virginia high-volatiles and in the Pittsburgh field more than offset the slight losses registered in some parts of Ohio and Kentucky and put *Coal Age* Index of spot bituminous prices on Aug. 30 at 168, with a corresponding price of \$2.04—an increase of three points and 4c. over Aug. 23.

Production Holds Up

Production, too, is well maintained. The output for the week ended Aug. 21 was estimated by the U. S. Bureau of Mines at 10,552,000 tons. Loadings the first two days of last week suggested a still heavier production. Cumulative output since Jan. 1 approximates 342,309,000 net tons—a total slightly ahead of 1920 output on the corresponding date and exceeded since that time only in 1923 when the cumulative total stood at 360,890,000 tons. West Virginia and Pennsylvania are contributing about 56 per cent of the total tonnage.

Dumpings of bituminous coal at the lower lake ports totaled 871,756 net tons of cargo and 45,684 tons of vessel fuel during the week ended Aug. 29. This was an increase of 109,789 tons over the preceding week, but less than 1,000 tons over the corresponding week last year. The cumulative total to date, however, is well ahead of recent years, viz., 18,375,655 tons this year, as against 16,244,652 tons in 1925 and 13,860,098 tons in 1924.

The anthracite division of the trade is marking time waiting for the fall season to get under way. August production dropped behind the 1925 weekly rate for that month, but the 1925 rate was abnormally swelled by pre-strike buying. The steam coals, which have been lagging, are beginning to show signs of recovery.



Estimates of Production

(Net Tons)

BITUMINOUS

	1925	1926
Aug. 7.....	9,971,000	10,150,000
Aug. 14 (a).....	10,261,000	10,628,000
Aug. 21 (b).....	10,522,000	10,552,000
Daily average.....	1,754,000	1,759,000
Cal. yr. to date..... (c)	304,165,000	342,309,000
Daily av. to date.....	1,542,000	1,735,000

ANTHRACITE

Aug. 7.....	2,011,000	1,843,000
Aug. 14 (b).....	1,857,000	1,937,000
Aug. 21.....	2,155,000	1,782,000
Cal. yr. to date..... (c)	58,531,000	50,244,000

BEEHIVE COKE

Aug. 14.....	124,000	163,000
Aug. 21 (b).....	144,000	183,000
Cal. yr. to date..... (c)	6,200,000	7,919,000

(a) Revised since last report. (b) Subject to revision. (c) Adjusted to equalize number of days in the two years.

Middle Western Demand Expands

Middle Western demand now has broadened enough to take in the more desirable offerings of the Illinois and Indiana districts. A number of idle mines have been re-opened and predictions of a resumption of full-time operations are freely made. For the present, however, buying centers on lump coal. Southern Illinois egg and nut are not overly active and there is no snap to the trading in steam sizes. Mines working in the Duquoin and Jackson County area are raising more coal, aided at some operations by a slight increase in railroad demand.

Locomotive fuel orders are the mainstay of the Mt. Olive district, although signs of a revival in domestic buying are beginning to appear. The Standard field still works on a hand-to-mouth basis, with aggregate tonnage low and prices unchanged. Fourth Vein Indiana coals are enjoying a somewhat better market, but the Fifth Veins are

finding hard sledding and prices on the latter are an uncertain quantity.

The call for high-grade eastern Kentucky coal is so great that shippers to the Chicago market are reluctant to book new orders and prices are advancing. Car shortage is adding to the tightness in this field. Tidewater demand makes many West Virginia producers indifferent to the Western situation. Those who continue to ship west, however, find the market ready to absorb their offerings at higher prices. Scarcity of spot smokeless is creating a greater demand for high-grade high volatile as a substitute.

St. Louis Market Looking Up

St. Louis, generally a stronghold of pessimism, actually finds domestic business holding its recent gains. High-grade Illinois coals are moving in greater volume despite the fact that western Kentucky is making headway in the domestic market. In the local steam market there is some storage

buying of Standard coal. Coke is active, but smokeless and anthracite are in the shadows. In the country, domestic consumers show more interest in central Illinois and western Kentucky. Missouri generally also is buying more West Virginia and eastern Kentucky coals. Local steam demand is quiet; country industrial business is spotty.

Prepared sizes of Kentucky coals are growing stronger, but the increase in production to meet this demand is weakening the market in screenings. Western Kentucky screenings have softened to 75@95c. in the Louisville market and some eastern Kentucky slack can be had as low as 90c. On the whole, however, the price situation is healthier than it has been for some time. Mine-run quotations are unchanged and there is talk of boosting prepared prices in both fields before the month is very old.

Car shortage is becoming noticeable, particularly in the eastern part of the state. In the western section, no com-

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern					Midwest				
	Market Quoted	Aug. 31 1925	Aug. 16 1926	Aug. 23 1926	Aug. 30 1926†		Market Quoted	Aug. 31 1925	Aug. 16 1926
Smokeless lump.....	Columbus....	\$4.00	\$3.75	\$3.75	\$4.00@4.50	Franklin, Ill. lump.....	Chicago.....	\$3.10	\$3.00
Smokeless mine run.....	Columbus....	2.15	2.15	2.15	2.10@2.40	Franklin, Ill. mine run.....	Chicago.....	2.35	2.40
Smokeless screenings.....	Columbus....	1.50	1.40	1.40	1.35@1.50	Franklin, Ill. screenings.....	Chicago.....	1.95	1.80
Smokeless lump.....	Chicago.....	4.25	3.60	4.10	4.25@4.50	Central, Ill. lump.....	Chicago.....	2.85	2.60
Smokeless mine run.....	Chicago.....	2.60	2.20	2.30	2.25@2.50	Central, Ill. mine run.....	Chicago.....	2.10	2.10
Smokeless lump.....	Cincinnati.....	3.85	3.50	3.85	4.00@4.25	Central, Ill. screenings.....	Chicago.....	1.55	1.50
Smokeless mine run.....	Cincinnati.....	2.35	2.10	2.35	2.25@2.50	Ind. 4th Vein lump.....	Chicago.....	2.85	2.60
Smokeless screenings.....	Cincinnati.....	1.60	1.35	1.50	1.50@1.75	Ind. 4th Vein mine run.....	Chicago.....	2.35	2.25
Smokeless mine run.....	Boston.....	4.90	5.00	5.40	5.35@5.50	Ind. 4th Vein screenings.....	Chicago.....	1.60	1.75
Clearfield mine run.....	Boston.....	1.70	1.85	1.85	1.75@2.00	Ind. 5th Vein lump.....	Chicago.....	2.35	2.35
Cambria mine run.....	Boston.....	2.00	2.05	2.05	1.90@2.25	Ind. 5th Vein mine run.....	Chicago.....	1.95	2.00
Somerset mine run.....	Boston.....	1.85	1.95	1.95	1.85@2.10	Ind. 5th Vein screenings.....	Chicago.....	1.20	1.50
Pool 1 (Navy Standard).....	New York.....	2.55	2.60	2.55	2.40@2.75	Mt. Olive lump.....	St. Louis.....	2.50	2.35
Pool 1 (Navy Standard).....	Philadelphia.....	2.60	2.65	2.65	2.50@2.80	Mt. Olive mine run.....	St. Louis.....	2.00	2.15
Pool 1 (Navy Standard).....	Baltimore.....	2.05	2.15	2.15	2.15@2.20	Mt. Olive screenings.....	St. Louis.....	1.75	1.55
Pool 9 (Super. Low Vol.).....	New York.....	2.00	2.05	2.05	1.90@2.25	Standard lump.....	St. Louis.....	2.25	2.25
Pool 9 (Super. Low Vol.).....	Philadelphia.....	2.05	2.10	2.10	2.00@2.25	Standard mine run.....	St. Louis.....	1.80	1.80
Pool 9 (Super. Low Vol.).....	Baltimore.....	1.90	1.85	1.85	1.80@1.90	Standard screenings.....	St. Louis.....	1.30	1.35
Pool 10 (H.Gr. Low Vol.).....	New York.....	1.80	1.85	1.85	1.75@2.00	West Ky. block.....	Louisville.....	2.10	1.70
Pool 10 (H.Gr. Low Vol.).....	Philadelphia.....	1.85	1.85	1.85	1.75@2.00	West Ky. mine run.....	Louisville.....	1.35	1.20
Pool 10 (H.Gr. Low Vol.).....	Baltimore.....	1.75	1.75	1.80	1.60@1.80	West Ky. screenings.....	Louisville.....	.75	.90
Pool 11 (Low Vol.).....	New York.....	1.60	1.70	1.70	1.65@1.80	West Ky. block.....	Chicago.....	2.05	1.75
Pool 11 (Low Vol.).....	Philadelphia.....	1.65	1.55	1.55	1.45@1.70	West Ky. mine run.....	Chicago.....	1.25	1.15
Pool 11 (Low Vol.).....	Baltimore.....	1.55	1.65	1.55	1.50@1.60				

High-Volatile, Eastern					South and Southwest				
	Market Quoted	Aug. 31 1925	Aug. 16 1926	Aug. 23 1926	Aug. 30 1926†		Market Quoted	Aug. 31 1925	Aug. 16 1926
Pool 54-64 (Gas and St.).....	New York.....	1.55	1.40	1.40	1.35@1.50	Big Seam lump.....	Birmingham.....	2.20	2.25
Pool 54-64 (Gas and St.).....	Philadelphia.....	1.60	1.45	1.45	1.40@1.55	Big Seam mine run.....	Birmingham.....	1.75	1.85
Pool 54-64 (Gas and St.).....	Baltimore.....	1.50	1.45	1.55	1.50@1.60	Big Seam (washed).....	Birmingham.....	1.85	2.00
Pittsburgh ac'd gas.....	Pittsburgh.....	2.50	2.25	2.20	2.25@2.40	S. E. Ky. block.....	Chicago.....	2.80	2.55
Pittsburgh gas mine run.....	Pittsburgh.....	2.15	2.00	1.95	2.00@2.20	S. E. Ky. mine run.....	Chicago.....	1.95	1.65
Pittsburgh mine run (St.).....	Pittsburgh.....	1.95	1.75	1.75	1.90@2.10	S. E. Ky. block.....	Louisville.....	2.85	2.50
Pittsburgh slack (Gas).....	Pittsburgh.....	1.55	1.25	1.25	1.20@1.25	S. E. Ky. mine run.....	Louisville.....	1.60	1.55
Kanawha lump.....	Columbus.....	2.55	2.25	2.25	2.25@2.75	S. E. Ky. screenings.....	Louisville.....	1.15	1.10
Kanawha mine run.....	Columbus.....	1.65	1.60	1.60	1.50@1.75	S. E. Ky. block.....	Cincinnati.....	2.55	2.35
Kanawha screenings.....	Columbus.....	1.30	1.15	1.15	1.10@1.25	S. E. Ky. mine run.....	Cincinnati.....	1.55	1.70
W. Va. lump.....	Cincinnati.....	2.35	2.50	2.25	2.25@2.50	S. E. Ky. screenings.....	Cincinnati.....	1.15	1.10
W. Va. gas mine run.....	Cincinnati.....	1.60	1.80	1.75	1.65@1.85	Kansas lump.....	Kansas City.....	4.35	4.25
W. Va. steam mine run.....	Cincinnati.....	1.40	1.60	1.55	1.50@1.60	Kansas mine run.....	Kansas City.....	3.10	3.00
W. Va. screenings.....	Cincinnati.....	1.15	1.10	1.10	1.25@1.50	Kansas screenings.....	Kansas City.....	2.50	2.50
Hooking lump.....	Columbus.....	2.75	2.35	2.40	2.35@2.50				
Hooking mine run.....	Columbus.....	1.65	1.55	1.55	1.40@1.75				
Hooking screenings.....	Columbus.....	1.40	1.20	1.20	1.15@1.25				
Pitts. No. 8 lump.....	Cleveland.....	2.50	2.15	2.15	1.85@2.50				
Pitts. No. 8 mine run.....	Cleveland.....	1.90	1.75	1.75	1.75@1.80				
Pitts. No. 8 screenings.....	Cleveland.....	1.55	1.30	1.35	1.25@1.30				

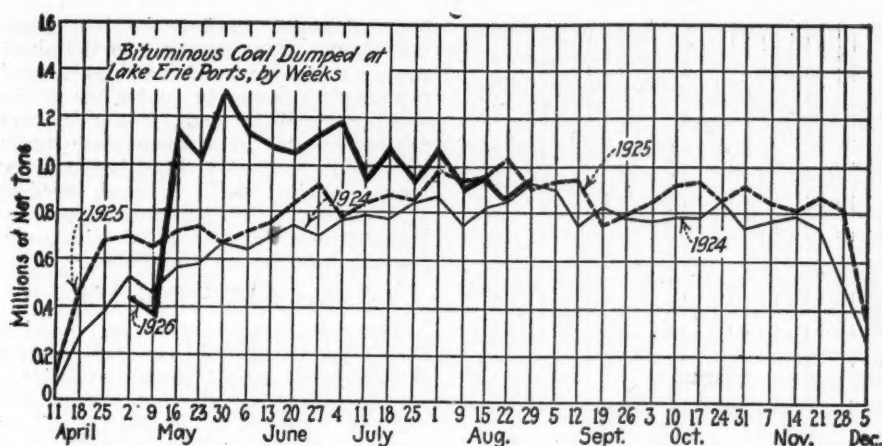
* Gross tons, f.o.b. vessel, Hampton Roads

† Advances over previous week shown in heavy type, declines in italics

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

		August 31, 1925		August 23, 1926		August 30, 1926†		
	Market Quoted	Freight Rates	Independent	Company	Independent	Company	Independent	Company
Broken	New York	\$2.34		\$8.20@8.90		\$8.50@9.25		\$8.50@9.25
Broken	Philadelphia	2.39		8.25@8.90	\$9.25	8.50@9.15	\$9.25	8.50@9.15
Exg.	New York	2.34	\$10.00@11.00	8.65@8.90	8.75@9.00	8.75@9.25	8.75@9.00	8.75@9.25
Exg.	Philadelphia	2.39	8.90@9.70	8.70@8.85	9.00@9.75	9.00@9.15	9.00@9.75	9.00@9.15
Exg.	Chicago*	5.06	8.17@8.60	8.03@8.28	8.14	8.13	8.14	8.13
Stove	New York	2.34	10.00@11.25	9.15@9.40	9.00@9.50	9.25@9.50	9.25@9.50	9.25@9.50
Stove	Philadelphia	2.39	9.15@10.75	9.15@9.30	9.15@10.20	9.35@9.50	9.15@10.20	9.35@9.50
Stove	Chicago*	5.06	10.00@11.00	8.48@8.80	8.59	8.33@8.58	8.59	8.33@9.50
Chestnut	New York	2.34	10.00@10.75	8.65@8.90	8.50@9.00	8.75@9.15	8.75@9.00	8.75@9.15
Chestnut	Philadelphia	2.39	9.15@10.15	8.85@8.90	8.50@9.75	9.00@9.15	8.50@9.75	9.00@9.15
Chestnut	Chicago*	5.06	10.00@11.00	8.28@8.50	8.39	8.33@8.53	8.39	8.33@8.53
Pea	New York	2.22	5.75@6.25	5.00@5.55	6.00@6.50	6.00@6.50	6.00@6.50	6.00@6.50
Pea	Philadelphia	2.14	5.50@5.90	5.00@5.50	6.00@6.75	6.00@6.50	6.00@6.75	6.00@6.50
Pea	Chicago*	4.79	5.25@5.75	5.05@5.36	6.03	6.10	6.03	6.10
Buckwheat No. 1	New York	2.22	2.30@2.75	2.50	1.75@2.25	3.00@3.50	1.75@2.25	3.00@3.50
Buckwheat No. 1	Philadelphia	2.14	2.50@2.75	2.50	1.85@2.50	2.25@2.75	1.85@2.50	2.25@2.75
Rice	New York	2.22	2.00@2.25	2.00	1.40@1.85	2.00@2.25	1.50@1.85	2.00@2.25
Rice	Philadelphia	2.14	2.00@2.25	2.00	1.30@2.00	1.75@2.25	1.30@2.00	1.75@2.25
Barley	New York	2.22	1.60@1.80	1.50@1.60	1.25@1.50	1.75@2.25	1.25@1.50	1.75@2.25
Barley	Philadelphia	2.14	1.50@1.75	1.50	1.25@1.75	1.50@1.75	1.25@1.75	1.50@1.75
Birdseye	New York	2.22			1.25@1.50	2.00	1.25@1.50	2.00

* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in italics.



plaint has yet been heard against car supply on the Illinois Central, but there is some delay in furnishing equipment on the Louisville & Nashville. Prompt despatch, however, is counteracting some of this delay. Railroads are urging shippers and consignees to load and unload as speedily as possible.

Spot Market Advance an Empty Gain

Gratification over the recent advances in spot quotations on bituminous coal at the Head of the Lakes is tempered by the fact that the rise did not start until after most of the season's contracts had been placed by the larger consumers. Some comfort, however, is extracted from the heavier buying along the iron ranges and the increase in orders from the Twin Cities and southern Minnesota for both steam and domestic purposes. Low water has forced many users of hydro-electric power to coal. Docks at Superior and Duluth are operating at capacity.

Bituminous stocks on hand at the docks approximate 5,000,000 tons. More coal is coming in, but the necessity for carrying so many different grades has reduced the effective storage space and some docks are struggling to avoid congestion in unloading. Demand for anthracite is picking up and shippers now are convinced that a normal amount will be consumed in the Northwest this season. Prices on both hard and soft coal are firm and unchanged.

Underlying conditions in the Twin Cities area have improved. Municipalities and school boards are placing orders for fuel supplies. Industries are more hopeful that consumer buying will justify steady production, but are tenacious in their drive for low prices when they talk to the coal man. Spot quotations, however, are firmer. At Milwaukee a strong demand is well distributed. Shippers are kept busy keeping abreast of orders.

Heavier Orders for Kansas Coals

Storage orders are strongly supporting the market in Kansas coals, but there is less buying of Arkansas semi-anthracite and semi-bituminous coals for future consumption. Kansas operators find a ready outlet for screenings at the \$2.35 basis. Cherokee lump is \$4.25@4.50. The Oklahoma situation continues dull.

Colorado reports a slight improvement in demand for sized coal. Domestic lump from the Walsenburg, Canon City and Crested Butte districts was held at \$5.50 throughout August,

nut at \$5 and chestnut from the first two districts at \$3. Trinidad lump and nut were \$3.15; fancy chestnut, \$3. First-grade Crested Butte anthracite ranged from \$7 for furnace to \$8.75 for base-burner coal. Bituminous steam coals were \$1@1.40. Kemmerer and Rock Springs lump and nut commanded \$2.50 on west and northwest movement and \$4 on eastbound movement into Colorado, Nebraska and Kansas. Steam sizes were \$1@1.50.

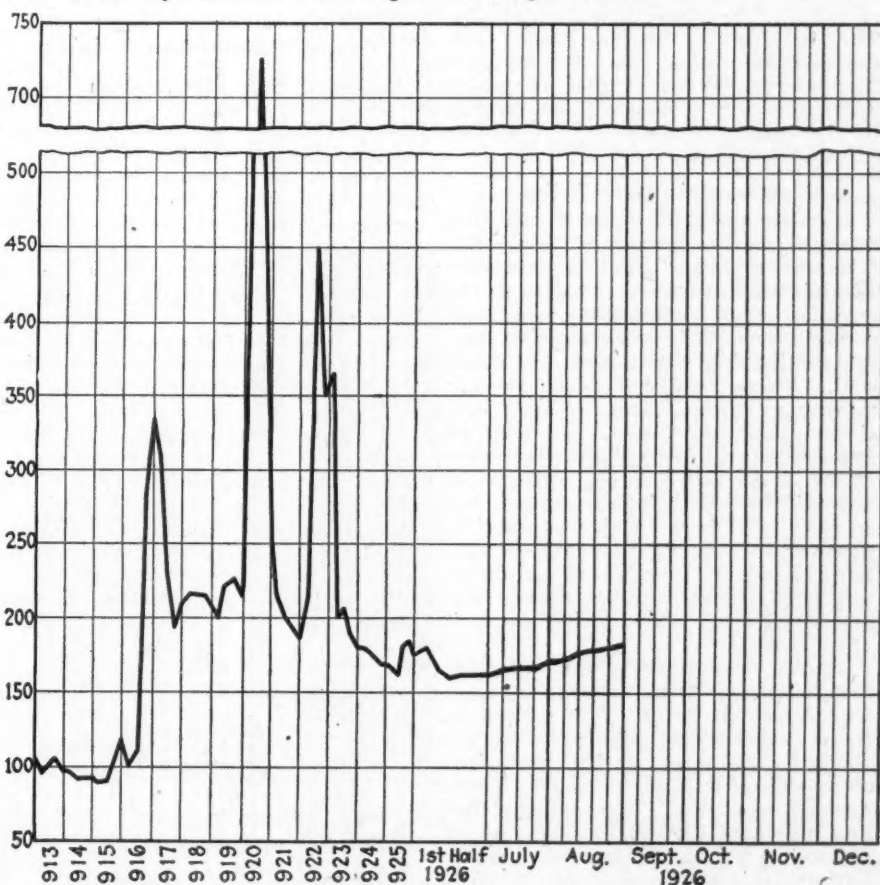
Utah operators have not had time to determine the reaction of the buyers to the new schedules which went into effect on Aug. 23. Mines are not averaging over three days a week. Some pro-

ducers are wondering whether the advances in retail prices which followed the boost at the mines will so slow up output that there will be another crisis in slack.

Buyers' Market at Cincinnati

Most of the pressure on low-volatile coals in the Cincinnati market last week came from the buyers soliciting producers to accept their orders. Lump and egg shot to \$4@4.25, with resistance to the higher price vanishing. Mine-run has been scarce; Western buyers snapped up tonnage at \$2.25 and bid \$2.50 for more. Chicago and lake buyers were canvassing the market trying to pick up odd lots of coal originally booked for tidewater and diverted or held up for one cause or another. Slack was less active, but there was no recession in prices.

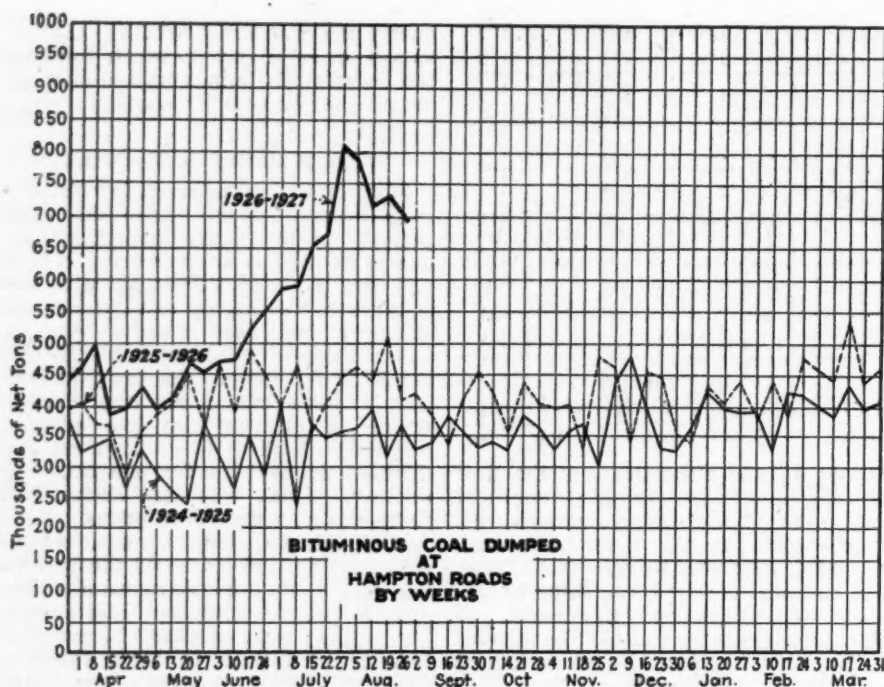
High-volatile lump quotations recovered from the slump of the preceding week, but did not go ahead like low-volatile prices. Mine-run held steady, but slack was weaker because of heavier production to meet insistent demands for sized coal. The slack situation undoubtedly would be worse than it is were it not for the broader lake market which the fine steam coal now enjoys. During the past week the lake trade was complicated by congestion at the lower lake docks, due to a shortage of bottoms.



Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

	1926	1925	1924
Aug. 30	168	165	164
Aug. 23	165	164	162
Aug. 16	164	162	183
Aug. 9	162	183	186
Aug. 31	183	186	
Aug. 30	186		
Weighted average price	\$2.04	\$2.00	\$1.99
		\$1.96	\$2.21
			\$2.01

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke: 1913-1918," published by the Geological Survey and the War Industries Board.



Movement of coal through the Cincinnati gateway last week declined. The total number of loads interchanged was 14,168 cars. This total was 470 cars less than in the preceding week and 1,864 cars less than a year ago. Included in the total were 3,348 cars en route to the lakes for transshipment. The decrease in this movement over the preceding week was only 48 cars. The interchange of empties increased approximately 1,000 cars, due largely to the heavier movement of open-top cars to the mines.

Central Ohio More Active

Definite strength characterizes the domestic market in central Ohio. The diversion of large quantities of West Virginia coal to tidewater has been the exciting cause. Retailers are concerned about their yard supplies and are coming into the market for more coal. Prices to the householder are moving upward. Steam business continues quiet, but there, too, may be found signs of increased activity. Some of the larger railroads are storing coal and utilities are building up their reserves. Southern Ohio production, however, shows no material change. Several mines have re-opened after prolonged suspension, but these gains are wiped out by the closing down of other operations.

The Cleveland market was somewhat reactionary last week. Smokeless lump was scarce at \$4.50. Spot prices on No. 8 prepared and mine-run were unchanged, but open market quotations on screenings weakened 5 to 10c. Steam demand was easy. The eastern Ohio field produced 222,000 tons of coal, or approximately 32 per cent of capacity, during the week ended Aug. 21. The total was 8,000 tons less than during the preceding week and 39,000 tons under the total for the corresponding period a year ago.

A decided recovery in prices took place in the Pittsburgh district last week. Under-cover buying of gas coal for export has pushed the quotations on mine-run to \$2@ \$2.20 and on three-quarter coal to \$2.25@ \$2.40. Steam

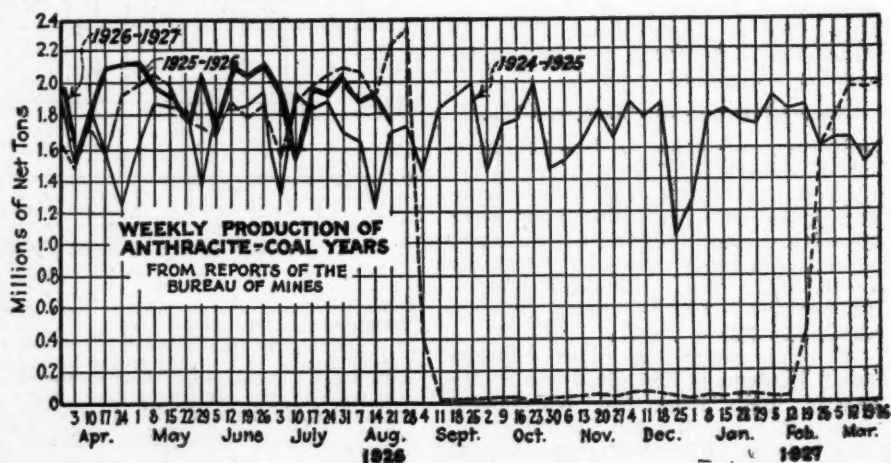
mine-run also is on a firmer basis, with \$1.90@ \$2.10 the ruling range. Some tonnage still can be had at \$1.60, but it is second-choice stuff. Steam slack is stronger, but gas slack has weakened a nickel. Domestic lump is opening at \$2.75, with a fair amount of early buying.

Central Pennsylvania Gaining

Central Pennsylvania production is steadily increasing, but current quotations are easing off under the larger output. During the first three weeks of August the loadings totaled 43,633 cars, compared with 38,846 cars for the corresponding period in July. Current quotations are: Pool 1, \$2.35@ \$2.75; pool 71, \$2.15@ \$2.25; pool 9, \$2.05@ \$2.10; pool 10, \$1.85@ \$1.95; pool 11, \$1.70@ \$1.75; pool 18, \$1.60@ \$1.65. Some foreign business has been booked, but the quantity has been disappointing.

The Buffalo bituminous market is as unexciting as it has been for months past. Prices on prepared low-volatile coal are advancing, but buying does not follow the increases. The past fortnight has seen a marked expansion in business in the Toronto market. Domestic consumers are beginning to lay in their winter's fuel. Industrial buying also has improved and prices on steam lump have been advanced 10c.

Actual demand for steam coal in the



New England market the last week was light. Due, however, to the short supply in the hands of the shippers and the steady advance in quotations at the southern loading piers, prices on cars at Boston and Providence were again increased. At Boston, \$6.50 is the going figure, against \$6.25 a week earlier; at Providence, the quotation has increased from \$6.25 to \$6.35, with some pockets holding out for \$6.50.

More All-Rail Coal Sold

There is more all-rail coal moving than a month ago, but the total volume of sales is not large. Buyers experience no difficulty in placing orders for medium volatiles at \$1.85@ \$2, mines; average low volatile, \$2@ \$2.35 and better grades, \$2.50, with some specialty coals bringing up to \$2.75. Stocks in the hands of consumers give them a comfortable margin of safety in staying out of the spot market except when prices are most favorable to them.

The New York bituminous market shows further improvement. New orders are not plentiful, but they are increasing in number and in some cases are placed at higher prices. Local factors in the trade feel that the effects of the British strike must be reflected in the central Pennsylvania situation before many more days have elapsed. The tidewater situation is in good shape, with a heavy call for coal bunkering purposes.

At Philadelphia the outlook daily grows more promising. There has been an undeniable increase in orders and a quickened interest upon the part of consumers heretofore indifferent to the possible effects of the British strike upon Pennsylvania production and prices. The latter, however, have changed little, but shippers are less willing to sell very far ahead and consumers who delayed placing contracts are faced with a demand for more money. The railroads are insisting upon full contract deliveries, but find the spot market not to their liking. Tide business is heavier and a number of export cargoes have been loaded.

Baltimore Buyers Weaken

Baltimore purchasing agents who have been holding out for months against signing on the dotted line are beginning to weaken in their determination to stay out of the market until there was another break in prices. Many continue to buy on a hand-to-mouth basis, but others are placing

Car Loadings and Supply

	Cars Loaded—	
	All Cars	Coal Cars
Week ended Aug. 14, 1926.....	1,109,557	193,184
Week ended Aug. 7, 1926.....	1,083,199	183,088
Week ended Aug. 22, 1925.....	1,080,107	201,095
Week ended Aug. 15, 1925.....	1,064,793	190,979

	Surplus Cars—		Car Shortages—	
	All Cars	Coal Cars	All Cars	Coal Cars
Aug. 13, 1926..	171,269	40,700
Aug. 6, 1926..	179,771	45,836
Aug. 14, 1925..	217,190	62,058

contracts or making inquiries. The export trade has been responsible for this change of attitude. Advances at the southern ports and a steady run of foreign orders to Baltimore are having their effect upon domestic industrial sentiment.

The Birmingham district market is jogging along with little to distinguish one week from another. Inquiry has improved, but there has been little gain in the tonnage of spot business booked and new contracts are infrequent. Deliveries on existing contracts are well maintained and current consumption is large. On the whole, domestic movement is backward. The better grades of coal attract a few scattering spot orders, but inferior coals are without call. The coke market is strong, with spot orders readily absorbing any surplus tonnage.

Anthracite is moving freely at New York. Buying is on a par with that of the recent weeks. Prospects for an active fall are considered bright. Retail distributors have bought heavily this summer. Independent coals are in better shape. Movement is steady and quotations, in many cases, are higher than they were last week. Steam coals also are in a more favorable position. No. 1 buckwheat is less unstable, with the better grades bringing good prices. Rice and barley are stronger.

Philadelphia Still Lags

The Philadelphia anthracite market is not quite as cheerful as the New York market. Retailers report considerable betterment in the volume of orders received, but this has not been reflected in any marked increase in shipments from the mines. Stove still leads in popularity and some companies—those with the lowest prices—are unable to make deliveries as promptly as some receivers would like. Nut is growing in favor.

There has been no decrease in the amount of steam tonnage moved to the consumers, but there still is a heavy surplus of unsold coal to plague the producers. The larger companies place the surplus in storage, but the independent shippers, less happily situated, must cut prices to keep the coal moving. Fortunately the regular users, contract customers, exhibit a tendency to take more nearly their regular shipments. Baltimore is not clamoring for coal, but a seasonal increase in ordering is noticeable.

Retail anthracite demand is also somewhat better in Boston and the dealers are showing more interest in spot tonnage. Buffalo, too, reports an improving local call for hard coal, but there is sharp competition in both wholesale and retail prices. During the

week ended Aug. 22 shipments of anthracite coal by lake from Buffalo totaled 67,500 tons, of which 45,100 tons cleared for Duluth and Superior, 13,700 tons for Chicago and 8,700 tons for Milwaukee. The decrease in dumpings was charged to congestion at the upper lake docks.

Coke Market Uneasy

The Connellsville coke market is extremely sensitive at the present time. The excitement in the furnace contract market has died out and the ovens have revised their ideas of what prices should be. Spot furnace coke is now quotable at \$3.10@3.25, but some coke has been sold at \$2.90, or less, and considerable, relatively speaking, has moved around \$3.10. The spot foundry coke market is quiet at \$4@4.50. There has been a slightly broader demand for raw coal.

Coke production in the Connellsville and Lower Connellsville region during the week ended Aug. 21 totaled 126,860 tons, according to the Connellsville *Courier*. Furnace-oven production was 66,900 tons, an increase of 5,200 tons over the preceding week. Merchant-oven output was 59,960 tons, a decrease of 750 tons.

The feasibility of conducting conversations through strata of considerable thickness has been demonstrated by experiments being conducted by the Bureau of Mines at Pittsburgh. Conversations have been maintained through 400 ft. of overlying strata at a commercial mine. Dry cells are used to furnish the energy. Modified telephone parts are used as transmitting and receiving apparatus.



Trophy for Best Retail Hard-Coal Advertising-Merchandising Plan

To encourage and reward exceptional merit in advertising-merchandising campaigns by retail dealers or retail associations the Anthracite Operators' Conference has offered this large solid silver cup, which will be awarded at the convention of the New York State Coal Merchants' Association, at Saratoga Springs, N. Y., Sept. 2-4. Charles B. Staats, president of the association, has named as judges Samuel Drummond, secretary, Brooklyn Coal Exchange; W. A. Clark, president, Boston Coal Exchange; and Jesse C. Suter, managing director, Coal Merchants' Board of Trade, Inc., of Washington, D. C.

Push Plans for Segregating Hudson Coal Properties

Progress toward segregation of the Delaware & Hudson coal properties was indicated last week by the announcement of the company that a special meeting had been called for Oct. 26, at which the stockholders will consider the transfer of all the company's interests, transportation and mining, to a corporation controlled by complete stock ownership by the present Delaware & Hudson Co.

Decision to hold a special stockholders' meeting was made by the board of managers, which on May 12, 1925, was authorized to transfer to a separate corporation all of the anthracite properties owned by the company. The board now seeks the permission of the stockholders to transfer to a separate corporation all of the company's properties.

According to the announcement the transfer will be "for such consideration in the form of stocks, bonds or other securities of the purchasing corporation as the board of managers may deem adequate and advantageous."

Regarding the authority sought for segregation of the coal properties, the statement says that "this problem has hand constant study and consideration, and the conclusion has been reached that it would be to the advantage of the stockholders if the board of managers were given the further power, as an alternative method of accomplishing a substantially identical result, to transfer the transportation and allied interests, or any of them, owned by the Delaware & Hudson Co. to a corporation or corporations controlled by complete stock ownership."

"Among the advantages of such a course would be the preservation of the historic character of your company, which has now more than 100 years of prosperous activity—a landmark not lightly to be removed from the industrial world."

Royalties on Mineral Leases On Public Lands Drop

Payments to state governments of their share of receipts from bonuses, royalties and rentals from oil, gas, coal and other mineral leases on public lands for the fiscal year ending June 30, 1926, amounted to \$3,173,851.27, representing 37½ per cent of receipts from leases on public lands within their borders in accordance with the terms of the General Leasing Law. This was \$283,056.80 less than the payments in the preceding year.

The largest amount was paid to the state government of Wyoming, its share of the receipts being \$2,585,698.59. California was second, receiving \$433,475.44, while Montana was third, with receipts amounting to \$98,482.97. The payments to other states were as follows: Alabama, \$345; Colorado, \$31,531.94; Idaho, \$370.36; Louisiana, \$350.06; Nevada, \$561.43; New Mexico, \$6,539.01; North Dakota, \$3,457.36; South Dakota, \$90.06; Utah, \$12,311.93; Washington, \$637.12.

Foreign Market And Export News

Increased Wages and Frantic Buying Boost French Prices

Paris, France, Aug. 12.—French collieries are receiving more orders from all classes of buyers, both foreign and domestic. Prices, already rising because of the extraordinary demand created by the prolonged British strike, will be further effected by increases recently granted to the mine workers.

At a conference at Douai on Aug. 7 representatives of the owners and workers in the Nord and Pas-de-Calais group agreed on a 15 per cent increase in base rates of pay, plus an increase of 10 per cent providing in later agreements. In the Loire basin day rates have been increased 1.50 @ 3.25 fr. These increases became effective Aug. 16 and will mean advances of 10 @ 50 fr. in coal prices.

The sympathetic strike announced for last Saturday failed to give any real comfort to British mine workers. In no French district did more than 25 per cent of the men fail to report for work and the percentage of absentees was even less in the Nord and Pas-de-Calais mines.

Norway Increases Consumption

Norwegian consumption of coal shows a slow, steady growth, notwithstanding the rapid development of hydroelectric power for industrial purposes and the increasing use of oil as a fuel, according to a report to the Department of Commerce, Norway's current consumption of coal averages 2,000,000 metric tons per year, in addition to which about 500,000 tons of imported coke are consumed.

It is believed in Norway, however, that the peak in coal consumption has about been reached, owing to the abundance and cheapness of hydroelectric power and to the increasing use of oil for the merchant fleet. The hydroelectric works supply an increasingly large part of the industrial power consumption—at the same time being used to a considerable extent for cooking and heating purposes—and the motor tonnage of the merchant fleet is growing very rapidly.

The current demand for coal in the Norwegian market is below what may be considered normal. Industrial activity is at a rather low ebb, and shipping has also for a long time been poorly employed.

The market conditions have been greatly influenced by the prolonged strike of the British coal mining industry, and although no difficulties have as yet been encountered in obtaining sufficient supplies to satisfy the Norwegian demand, prices as a result of the British situation have advanced about 15 to 20 per cent. Since the beginning of the English strike no English coal has been imported.

Belgium Restricts Coal Exports

The Belgian government is restricting the issue of licenses to export coal to 250,000 tons a month, only the mining companies being allowed to export in order to fulfill existing contracts. Following price increases during July of 30 to 40 per cent, coal quotations are now steady and the reaction is said to be due probably to the higher franc exchange, to the export license restriction, and to the expiration on Sept. 1 of the prohibition against the free importation of German coal.

Stocks of coal at the mines are negligible. There is a good demand from France for household grades and long-term contracts for bunker coal have been received at Antwerp. During the first half of 1926 coal imports totaled 3,902,000 metric tons as compared with 4,519,000 metric tons during the same period of last year. Exports during the periods referred to were 1,609,000 metric tons and 985,000 metric tons, respectively. Miners' wages were increased by 5 per cent on Aug. 15.

Export Clearances, Week Ended Aug. 26

FOR HAMPTON ROADS

For United Kingdom:	
Br. Str. Kepwickhall.....	7,153
Span. Str. Angela.....	6,018
Br. Str. Vestalia.....	7,774
Belg. Str. Texandrier.....	6,978
Br. Str. Cornish City.....	7,136
Ital. Str. Euro.....	7,362
Br. Str. Roxby.....	6,971
Jap. Str. Glasgow Maru.....	7,810
Ital. Str. Reica.....	7,545
Br. Str. Lornaston.....	7,632
Ital. Str. Valnoce.....	6,419
Nor. Str. Delaware.....	5,538

For England:	
Span. Str. Lolín, for London.....	5,431
Br. Str. Neatsfield, for Manchester..	7,007
Br. Str. Apsley Hall, for Manchester	7,370

For New Brunswick:	
Nor. Str. Start, for St. John.....	1,614

For Uruguay:	
Ital. Str. Mart, for Montevideo.....	4,040

For Brazil:	
Br. Str. Swinburne, for Para.....	124
Br. Str. Stokesby, for Rio de Janeiro	5,684
Br. Str. Lord Londonderry, for Rio de Janeiro	6,541

For Scotland:	
Br. Str. Nessian, for Glasgow.....	8,513
Amer. Str. Severance, for Glasgow..	6,534

For Argentina:	
Br. Str. King Alfred, for Buenos Aires	6,696
Br. Str. Pontypidd, for Buenos Aires	6,993
Br. Str. Tremorvah, for La Plata..	6,525

For British West Indies:	
Br. Str. Matura, for Demerara.....	1,019

For Italy:	
Ital. Str. Clara, for Venice.....	3,978
Ital. Str. Zovetto, for Naples.....	6,346

For Dominican Republic:	
Amer. Str. Wellington, for Sanchez..	1,545

For Bermuda:	
Br. Schr. Alfred Ock Hedley, for St. Georges	874

For Cape Verde Islands:	
Br. Str. Antar, for St. Vincent.....	9,511

For Venezuela:	
Amer. Schr. Eleanor F. Bartram, for Puerto Cabello	1,431

For Canary Islands:	
Grk. Str. Diontsios Stahhatos, for Los Palmas	7,435

For Egypt:	
Br. Str. General Church, for Port Said	9,100

FROM BALTIMORE

For Ireland:	
Span. Str. Eretza Mendi, for Queens- town for orders.....	5,673
Ital. Str. Vodicé, for Queenstown for orders	6,707

Br. Str. Maindy Grange, for Queens- town for orders	7,134
Belg. Str. Elzasier, for Queenstown for orders	7,251
Br. Str. Baron Fairlie, for Queens- town for orders	9,115
Br. Str. Andreas, for Queenstown for orders	8,917
Br. Str. Glenfinlas, for Belfast.....	4,678
Br. Str. Bradavor, for Queenstown for orders	7,280
Br. Str. Eastwood, for Dublin.....	5,261
Br. Str. Fishpool, for Queenstown for orders	7,424
Span. Str. Aritz Mendi, for Queens- town for orders	7,080
Br. Str. Cogandale, for Queenstown for orders	8,412
Br. Str. Wearpool, for Queenstown for orders	8,048
Pan. Str. Ereno, for Queenstown for orders	5,477
Br. Str. Barrhill, for Queenstown for orders	7,280
Br. Str. Issifogliu, for Queenstown for orders	8,061
Br. Str. Alistruther, for Queenstown for orders	5,937
Span. Str. Artagan Mendi, for Queens- town for orders	7,019
Br. Str. Kingswood, for Queenstown for orders	6,099
For Egypt:	
Br. Str. Mortlake, for Alexandria...	4,249
For Argentine:	
Br. Str. Chelsea, for Buenos Aires...	6,518
Br. Str. Modesta, for Ibiény.....	4,779
Br. Str. Kassala, for Ibiény.....	5,094
For Italy:	
Ital. Str. Areadia, for Venice.....	4,632
Ital. Str. Ettore, for Leghorn.....	6,600
Ital. Str. Ada O, for Genoa.....	6,426
For French West Indies:	
Br. Str. Berwindmoor, for Martinique	9,214
For Norway:	
Dan. Str. Brosund for Oslo.....	4,538

FROM PHILADELPHIA

For United Kingdom:	
Br. Str. London Corporation, for Queenstown	—
Br. Str. Rhymney, for Queenstown..	—
Br. Str. Anglo-Indian, for Queens- town	—
Du. Str. Procyon, for Queenstown...	—
For Cuba:	
Br. Str. Firpack, for Habana.....	—
Br. Mtshp. Munmotor, for Habana..	—
For Jamaica:	
Nor. Str. Port Antonio, for Kingston	—
Nor. Str. Juan, for Kingston.....	—
For Turkey:	
Br. Str. Greicaily, for Constantinople	—
For Italy:	
Ital. Str. Vesuvio, for Naples.....	—
For Canary Islands:	
Nor. Str. Jacob Christensen, for Las Palmas	—
Dan. Str. Norlys, for Tenerife.....	—

Hampton Roads Coal Dumpings*

In Gross Tons			
N. & W. Piers, Lamberts Pt.:	Aug. 10	Aug. 26	
Tons dumped for week.....	248,485	234,316	
Virginian Piers, Sewalls Pt.:			
Tons dumped for week.....	190,694	209,767	
C. & O. Piers, Newport News:			
Tons dumped for week.....	219,872	180,175	

* Data on cars on hand, tonnage on hand and tonnage waiting withheld due to shippers' protest.

Pier and Bunker Prices, Gross Tons

PIERS

Aug. 21, 1926 Aug. 28, 1926†			
Pool 1, New York....	\$5.35@5.65	\$5.35@5.60	
Pool 9, New York....	4.85@ 5.10	4.85@ 5.10	
Pool 10, New York....	4.60@ 4.85	4.60@ 4.65	
Pool 11, New York....	4.35@ 4.50	4.35@ 4.50	
Pool 9, Philadelphia..	4.85@ 5.20	4.85@ 5.20	
Pool 10, Philadelphia..	4.60@ 4.85	4.60@ 4.85	
Pool 11, Philadelphia..	4.30@ 4.55	4.30@ 4.55	
Pool 1, Hamp. Roads.	5.25@ 5.40	5.25@ 5.50	
Pool 2, Hamp. Roads.	4.75@ 4.85	5.00@ 5.15	
Pool 3, Hamp. Roads.	4.40@ 4.50	4.60	
Pools 5-6-7, Hamp. Rds.	4.50@ 4.60	4.75@ 4.85	

BUNKERS

Pool 1, New York....	\$5.60@5.90	\$5.60@5.85	
Pool 9, New York....	5.10@ 5.25	5.10@ 5.35	
Pool 10, New York....	4.85@ 5.10	4.85@ 5.10	
Pool 11, New York....	4.60@ 4.75	4.60@ 4.75	
Pool 9, Philadelphia..	5.10@ 5.35	5.10@ 5.35	
Pool 10, Philadelphia..	4.90@ 5.10	4.90@ 5.10	
Pool 11, Philadelphia..	4.55@ 4.85	4.55@ 4.85	
Pool 1, Hamp. Roads..	5.40	5.50	
Pool 2, Hamp. Roads..	4.75	5.15	
Pools 5-6-7, Hamp. Rds.	4.60	4.85	

† Advances over previous week shown in heavy type; declines in italics.

Coming Meetings

American Chemical Society. Sept. 7-11, Bellevue Stratford Hotel, Philadelphia, Pa. Secretary, Dr. Charles L. Parsons, Washington, D. C.

Rocky Mountain Coal Mining Institute. Glenwood Springs, Colo., Sept. 9-11. Secretary, Benedict Shubart, Boston Building, Denver, Colo.

Joint convention of the Western Division of the American Mining Congress, American Institute of Mining and Metallurgical Engineers, American Association of Petroleum Geologists and American Silver Producers' Association at Denver, Colo., Sept. 20-24.

American Institute of Mining and Metallurgical Engineers. Oct. 6-9, at Pittsburgh, Pa. Secretary, H. Foster Bain, 29 West 39th St., New York City.

National Safety Council. Oct. 25-29, at Detroit, Mich. Managing director, W. H. Cameron, 108 East Ohio St., Chicago, Ill.

National Industrial Traffic League. Commodore Hotel, New York City, Nov. 17 and 18. Executive secretary, J. W. Beek, Chicago, Ill.

Coal Mining Institute of America. Annual meeting, Chamber of Commerce, Pittsburgh, Pa., Dec. 8, 9 and 10. Secretary, H. D. Mason, Jr., Box 604, Ebensburg, Pa.

Industrial Notes

The American Pulverizer Co., St. Louis, Mo., has appointed the Titzel Engineering & Equipment Co., Pittsburgh, Pa., as representative in western Pennsylvania, West Virginia and western Virginia.

The Jeffrey Manufacturing Co., of Columbus, Ohio, announces the election of Robert W. Gillispie as vice-president, assistant general manager and member of the board of directors. Mr. Gillispie has for many years been identified with the Bethlehem Steel Co. in executive sales work. He was graduated from Wesleyan University, Connecticut, in 1904.

At a meeting of the stockholders of the Fairmont Mining Machinery Co., M. L. Hutchinson, O. A. Seyferth, C. D. Robinson, J. H. Thomas, G. J. Anderson and H. L. Sargeant were named directors. A directors' meeting was also held and Mr. Hutchinson was elected chairman of the board, Mr. Seyferth was named president, Mr. Anderson, vice-president; Mr. Thomas, treasurer, and M. L. O'Neale secretary. The plant reports a pickup in contracts for the erection of coal tipples.

The Triumph Electric Corporation has been organized to take over the good will, designs, records, patent rights and inventions of the Triumph Electric Co., Cincinnati, Ohio. So far as practicable the new company will retain the old personnel. The new company will specialize on its TR self-start automatic heavy duty motor and at the same time be in a position to supply its other lines of electrical and refrigerating products.

New Equipment

Burns Pea Coal on Grate Top And Dust in the Air

In the "Pulverzone," a new type of coal-burning equipment, the fine particles of coal are burned in suspension and the larger pieces are spread over the entire grate area. The furnace is illustrated in the accompanying cut. It was recently developed by the CoKal Stoker Corporation, Wrigley Building, Chicago, Ill.

In reality this new device is an improved CoKal power-feed stoker with the added feature of a controlled air blast across the furnace front over the fire. This not only spreads the coal but produces a turbulence before, at and after ignition, the object of which is to intimately mix the air and the volatile constituents of the coal.

The principle of operation is clearly shown in the accompanying sectional elevation. Immediately beneath the ledge over which the coal feeds into the furnace, a series of steam or air nozzles are installed. These supply the blast. Eight, paired, V-shaped nozzles consisting of $\frac{1}{4}$ -in. pipe are flattened at the end to give a narrow rounding slot from which steam or air will flare out. These in combination with the other jets give a uniform blast across the width of the furnace. The pressure used varies with the character of fuel and the quantity being fed. The operating range will vary from approximately 5 to 30 lb., the latter pressure being required at the highest ratings. It is claimed that less than 2 per cent of the rated boiler capacity is required to produce turbulence, feed the coal and operate the entire mechanism.

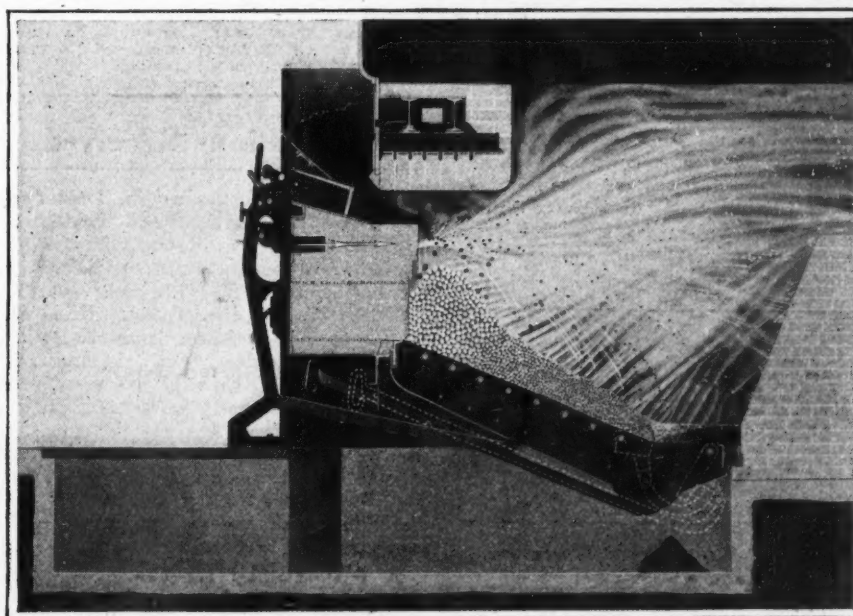
Passing through the falling curtain

of fuel, the blast carries the fine particles—amounting to 60 per cent in $\frac{1}{4}$ -in. screenings—into the furnace space, where they ignite in suspension. The coal particles are distributed over the fuel bed according to their weight, the coarser ones dropping into the coking zone at the front, and the lighter pieces passing toward the rear. Segregating the fuel in this manner so that like sizes fall into the same zone, after the removal of the fine particles, gives a porous fuel bed that offers low resistance to the air supply, so that intensive combustion with minimum draft is possible. It is claimed that ratings up to 350 per cent have been obtained.

Heat Maintained at Exact Temperature Desired

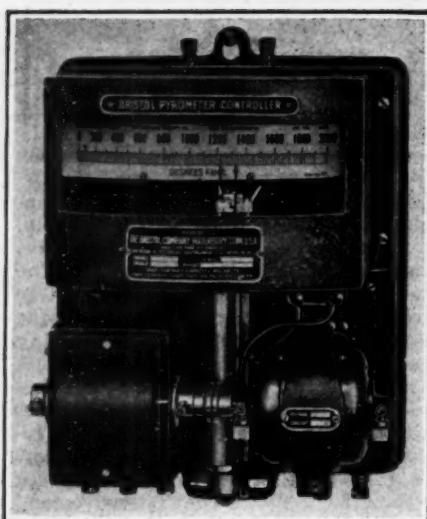
The Pyrometer controller Model No. 479, shown in the accompanying illustration, recently was placed on the market by the Bristol Co., of Waterbury, Conn. This instrument is fitted with an extra wide scale, motor drive and external contactor adjustment. Simultaneously the working parts have been made readily accessible for adjustment, inspection, oiling or repair. A governor is provided to regulate the speed of the driving motor, which is connected to the main shaft through a non-metallic coupling.

One advantageous detail of this instrument is the safety-adjusting mechanism for setting the position of the index at the point to which it is decided to bring the temperature. A small hinged cover incloses the adjusting knob. This knob, therefore, cannot be operated until the cover is opened,



Cross-Section Through a Boiler Furnace

Fuel falling from the feed ledge is subjected to the action of an air or steam blast. This deflects the larger pieces only slightly, carries the small particles to the back of the furnace and permits the dust to be burned in suspension.



Automatically Controls Heat

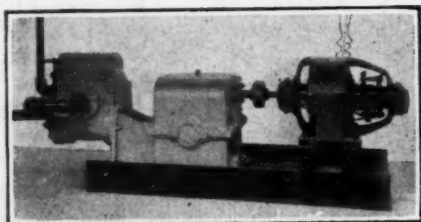
This instrument may be pre-adjusted to the temperature that it is desirable to maintain. All parts are readily accessible for inspection, lubrication or repair.

and opening the cover automatically forces the switch mechanism to its lowest position, free from the pointer. With this provision there is no possibility for the operator to damage the millivoltmeter movement.

This controller is designed for use with oil, gas or electrically heated equipment, such as ovens, furnaces, and the like. It can be used on any temperatures up to 3,000 deg. F.

Worm-Driven Gathering Pump Needs No Lubricant

The Dravo-Doyle Co., 300 Penn Ave., Pittsburgh, Pa., now offers a worm-driven gathering pump that requires lubrication not oftener than once in three to five years. The water end is a standard Austin plunger pump of 60- to 80-gal. capacity such as has been on the market for some time. The drive however is entirely new. It consists of a worm mechanism with a crank and crosshead that is totally inclosed and runs in 5 gal. of cylinder oil. All parts subject to wear operate in this oil bath. Men working around this pump are exposed to no danger inasmuch as all gears are inclosed. As this unit is only 15 in. wide it can be placed between the track and the rib without scaling off the rib to make room for the machine.



Gathers Water with Minimum Care and Hazard

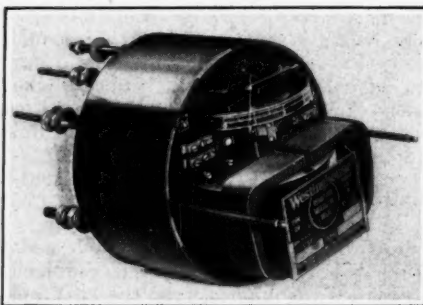
This pump is so copiously flood-lubricated that it may be operated for many years without lubricant replenishment. It thus is one of those machines that may be installed and then practically forgotten so far as lubrication is concerned. Being worm-driven it is no menace to those who work alongside it in a narrow roadway.

New-Type Relays Operate on Magnetic Vane Principle

A new type of direct-current relays has been developed and placed on the market by the Westinghouse Electric & Manufacturing Co., of East Pittsburgh, Pa. These include resistance measuring, over-current, voltage, polarized and other types. They closely resemble this company's induction-type alternating-current relays and occupy approximately equal switchboard space.

These instruments operate on the magnetic-vane principle and are so constructed that their operating current and voltage values, as well as their time of operation, may be determined accurately. They are so adjustable that their operating current may be varied as well as their operating time. A new form of contact made of chemically pure silver is employed. This is easily aligned or removed entirely by the aid of a screwdriver for cleaning or inspection.

The resistance-measuring relay has been developed for automatic service-restoring circuit-breakers and measures the resistance of the feeder. It recloses the breaker when indications are that the short-circuit has been cleared. One advantageous detail of this instrument is its time limit, which prevents the breaker from pumping rapidly when the trouble is of a recurring nature.



Circuit-Breaker Relay for Restoring Service

The particular relay shown is intended for use with self-closing breakers. A time-limit feature prevents pumping.

Publications Received

A Method of Trapping the Dust Produced by Pneumatic Rock Drills, by P. S. Hay, with a preface by Prof. J. S. Haldane. Mines Department, Safety in Mines Research Board, Paper No. 23. Pp. 18; 6x9 in.; illustrated. Price 6d. H. M. Stationery Office, Adastral House, Kingsway, London, W.C. 2, England. Describes an apparatus by means of which the dust produced in the drillhole is collected by a hood and conveyed by means of an ejector, operated by the exhaust air from the drill, to a filter bag, where the dust is intercepted and the filtered air passes out through the interstices of the material of the bag.

A Bibliography on Research. National Research Council, Division of Engineering and Industrial Research, New York City. Pp. 46, 6x9 in. Lists selected articles from the technical press covering the years 1923-1925. Only general articles on research are listed.

Trade Literature

Flameproof Electrical Apparatus for Use in Coal Mines, by C. S. W. Grice and R. V. Wheeler. Safety in Mines Research Board, Paper No. 21. H. M. Stationery Office, Adastral House, Kingsway, London, England. Price, 1s. 3d. net. Pp. 30; 6x9 in.; illustrated. This second report deals with perforated plate protection.

A Method for the Determination of the Velocity of Detonation Over Short Lengths of Explosive, by E. Jones. Safety in Mines Research Board, Paper No. 22. H. M. Stationery Office, Adastral House, Kingsway, London, England. Price, 9d. net. Pp. 21; 6x9 in.; illustrated. Describes a method that has been worked out by which concordant results can be obtained in the measurement of time intervals of the order of one-millionth of a second.

Proceedings of the Ninth Annual Meeting of the National Coal Association, held June 9-11, 1926. Pp. 221; 6x9 in.

Final Report of the Peat Committee, appointed jointly by the governments of the Dominion of Canada and the Province of Ontario, by B. F. Haanel. Mines Branch, Department of Mines, Ottawa, Canada. Pp. 298; 6x10 in.; illustrated.

Pennsylvanian Flora of Northern Illinois, by A. C. Noe. Department of Registration and Education, Division of the State Geological Survey, Urbana, Ill. Bulletin No. 52. Pp. 113; 7x10 in.; illustrated.

The Rockefeller Foundation—A Review for 1925, by George E. Vincent. Pp. 59; 6x9 in.; illustrated.

Annual Report of the Mines Branch of the Province of Alberta, 1925. Pp. 153; 6x10 in.

Molybdenum Means More-Life-In-Em—Why? is the title of a booklet issued by the Standard Steel & Bearings, Inc., Plainville, Conn., telling the story of the development of molybdenum steel for bearing purposes.

Worm Reduction Gear with Pressure Oiling System. De Laval Steam Turbine Co., Trenton, N. J. Pressure oiling systems for worm reduction gears are described and illustrated in this 4-pp. folder.

The General Electric Co., Schenectady, N. Y., has issued the following: Bulletin GEA-166, illustrating and describing its MTC and MQC open or enclosed alternating current Crane and Hoist Motors; GEA-467 (superseding 68,454) on its CR7022-A1 Automatic Starters for slip-ring induction motors; GEA-46A, Synchronous and Condenser Panels; GEA-80 (old series 68,459), Automatic Reduced Voltage Starters for Synchronous Motors describing their operation, overload protection, field actuating relay and protective features; GEA-468 (supersedes 68,204-C), Drum Type Controllers for use with direct-current adjustable-speed motors; GEA-449, (old series 64,005B), Line Material and Rail Bonds for Mines; GEA-434 (supersedes 61,308), Varying Speed Induction Motors for Elevator Service.